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Analysis of the 1991 Collections from the Larson Site (39WW2), Walworth County, South Dakota

August 29, 1995

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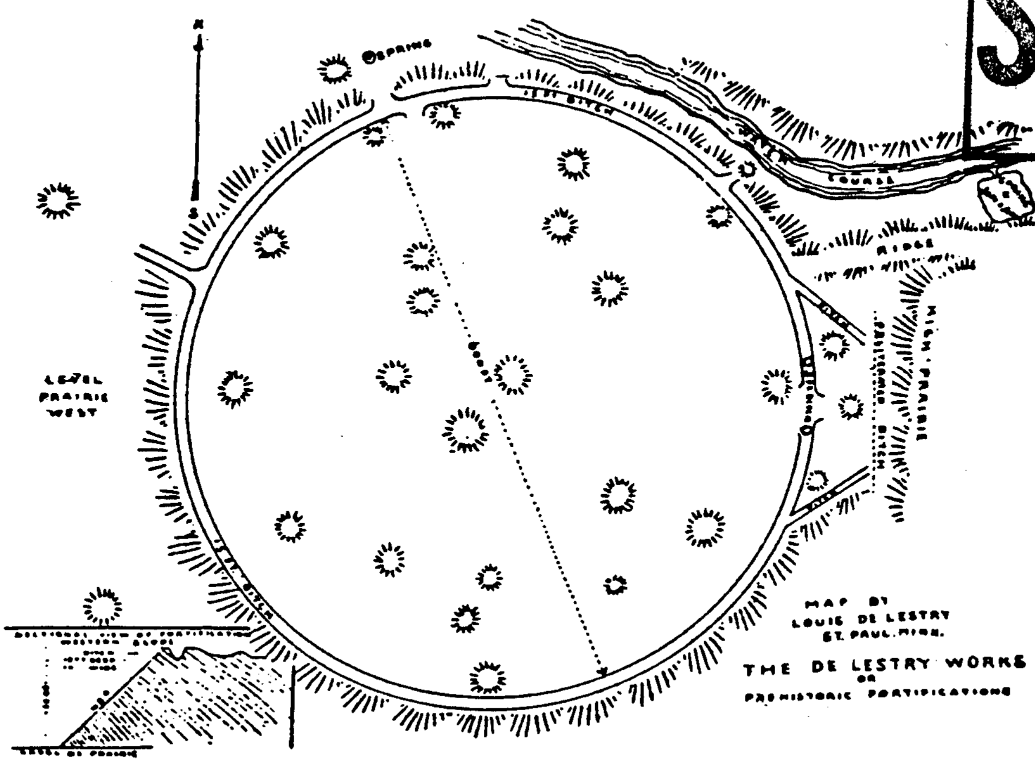

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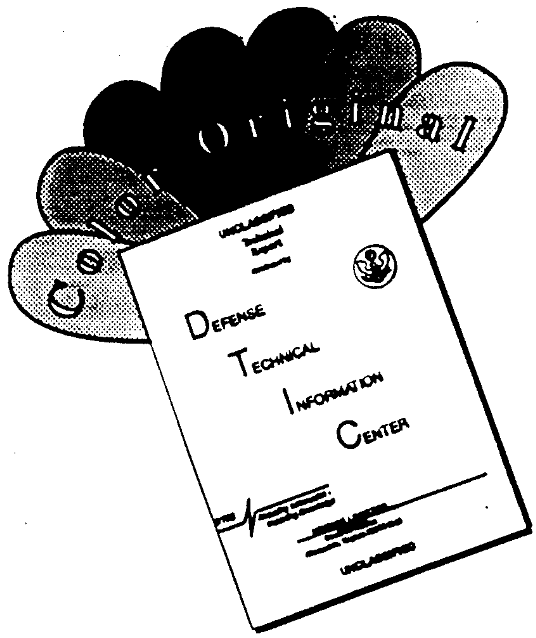

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Analysis of the 1991 Collections from the Larson Site (39WW2), Walworth County, South Dakota

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The 1991 archaeological data recovery program conducted by the Corps of Engineers resulted in the collections of 20 cartons of artifacts. The University of South Dakota Archeology Laboratory (ARCHLAB) analyzed the collections including ceramics (16,952 items), litchics (3,654), bone and shell (13,464), several samples of carbon and organic material (29), and a small amount of metal and other historic material (104). Human remains

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Plains village
Post-Contact Coalescent Variant
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Shell
Stanley phase
Talking Crow phase
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were discovered in the faunal collection. It was determined that the cultural material is consistent with an Arikara site of the Post-Contact Coalescent Variant (c. 1750-1780).

The site is recommended for the National Register of Histoic Places. The site retains an undisturbed context even though it is seasonally inundated and has the potential to provide important information regarding the history of settlement and social relations in the complex period in the Middle Missouri Sub-Area.

Abstract

The University of South Dakota Archaeology Laboratory (ARCHLAB) analyzed the collections from the Larson Site (39WW2) obtained during the archaeological data recovery program conducted by the Corps of Engineers, Omaha District, during the summer of 1991. The twenty cartons of artifacts contained ceramics (16,952 items), lithics (3,654), bone and shell (13,464), several samples of carbon and organic material (29), and a small amount of metal and other historic material (104). ARCHLAB analysts discovered human remains in the faunal collection.

The cultural material is consistent with an Arikara site of the Post Contact Coalescent Variant (c. 1750-1780).

It is recommended that this site be placed on the National Register of Historic Places. The site is seasonally inundated, but it retains an undisturbed context. Given the wealth of information derived from previous excavations and from the surface collection, this site has the potential to provide important information about the history of settlement and social relations in this complex period in the Middle Missouri Sub-Area.

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I. INTRODUCTION

The Larson site (39WW2) is a fortified earthlodge village and cemetery located about 2 miles south and east of Mobridge, South Dakota on the east bank of the Missouri River five miles south of the mouth of the Grand River (Figure 1). The site is in the SW¼, NE¼ of Section 32, Township 124, Range 79 in Walworth County. This location is in the Grand-Moreau Region of the Middle Missouri subarea of the Plains area (Lehmer 1971:28-29). At time of discovery, the property belonged to Mr. Lewis Larson; the village lay 20 rods northeast of his farm buildings (Over 1973:297).

The Larson site is situated on a high terrace overlooking the Missouri floodplain to the south, with its cemetery ascending a slope several hundred yards to the northeast. On the west is a small creek, on the east a shallow draw. At the time of first mapping (in the late 19th century), two natural springs were just outside the village fortifications, one slightly west of north and the other to the northeast (De Lestry 1897b). The soils at this site are alluvial and include Bearden Silt Loam and Tripp Loam (Machlis and Larson 1928).

Lehmer (1971) assigns this site to the Le Beau phase of the Post-Contact Coalescent Variant. The Le Beau phase is part of a ceramics-based typological sequence that includes the Stanley and Talking Crow phases; sites of these phases have broadly similar wares, the variety and frequency changing through time. The percentage of European trade goods at the site indicates an occupation around 1750-1785, while the crainometric and archaeological data suggest tribal affiliation with the Arikara (Deitrick 1980:3).

There are a number of other sites nearby (Figure 2). Just 250 meters northwest of Larson on the east bank is Travis 2 (39WW15), which has components from late Paleo-Indian through Plains Village (Ahler, et al 1977:64); and just 50 meters north of Larson is Sewer Bay (39WW41), a possible Plains Village site (Weston, et al 1979:55).

Sites nearby with an Extended Middle Missouri component on the west bank include Lower Grand or Davis (39CO14), Travis (39CO213), 39CO212, 39CO201, Calamity Village (39DW231) and 39DW224.

Extended Coalescent sites include Davis (39CO14), 39CO35, Travis (39CO213), 39CO17, 39CO18, 39CO202, and Potts (39CO19) on the west bank; and Spiry (39WW10) on the east bank (Lehmer 1971:117).

Post Contact Coalescent sites include: Norvold I (39CO31), Red Horse Hawk (39CO34), and 39CO17 on the west bank; and Anton Rygh (39CA4), Bamble (39CA6), Mobridge (39WW1), Spiry-Eklo (39WW3), Blue Blanket (39WW9), and Swan Creek (39WW7) on the east bank (Lehmer 1971:67, 134-5).

REPORT ORGANIZATION

This report describes how COE conducted the surface collection and what they recovered in each grid unit and outlines the methods used by ARCHLAB to analyze each category of artifact and the results obtained by that analysis. The work is augmented by maps and tables, color slides and black and white photographs of the field work and also of partial or complete diagnostic or unusual artifacts.

Brian L. Molyneaux, PhD was the principal investigator. Nancy J. Hodgson, MA supervised lab processing and analysis, with the consultation of Richard A. Fox Jr., PhD. Shesh Mathur, MA analyzed the ceramics assisted by Jim Jensen, Dena Roosa, and Damita Hiemstra with the consultation of Larry Zimmerman, PhD; Eloise Ramirez analyzed the lithics assisted by Stephanie Spars, Josh Cook, and Barb DeBois with the consultation of Andrew Stewart, PhD; and Eloise Ramirez examined and identified the bones assisted by Josh Cook, Stephanie Spars, and Dena Roosa with the consultation of Larry Bradley, PhD and Richard A. Fox, Jr. Andrew Stewart and B. J. Smith, PhD conducted statistical tests and Heather Erickson, Damita Hiemstra and Jim Jensen entered information in the database. Ronald Marvin prepared the maps and edited the layout.

PREVIOUS RESEARCH

The Larson site was first reported by Louis De Lestry who led an expedition backed by the *St. Paul Dispatch* to explore "Indian Mounds" reported to be along the Missouri River in Walworth County, South Dakota. He chose as his companions W. H. Adams, a lawyer who had noticed these mounds, and W. H. Casler, a "very good amateur photographer" (De Lestry 1897a). De Lestry described three areas across from the mouth of the Grand River and stretching 5 miles south: the Adams' Grand River Group of mounds (39WW1), the Carlson Group (39WW3), and the Prehistoric Fort on Larson's farm (39WW2). He described this (De Lestry 1897b; Figure 4) as an almost perfect circle:

> The walls of this fortification are very acute and the slope is on three sides at an angle of 45 degrees, steep enough to make the ascent even now quite difficult. Having reached the summit of the hill, we measured a diameter of 600 feet, allowing a circular condition to this remarkable work. Nothing could be more clearly defined than the outer and inner breastworks, or earth walls, with a ditch running between both of a depth of 15 feet and a width of 10 feet.
>
> On the north side of this fortification is a natural defense in the shape of a water course, which at present only contains a little water, the overflow of a spring...
>
> It [the fortification] contains a large number of interior fortifications [mounds] and depressions clearly marked....The position is a very commanding one. In fact, the fortification is the key to the entire valley northward, and also a sure defense of the ground against any approach from the high prairie.

W.H. Over visited the site in 1917 and 1920. He described it (Over 1973:298) as

> situated on a high terrace, flanked on the west by a small creek and on the east by a shallow draw or ravine. The south point overlooks the Missouri River floodplain. The northern part of the terrace slopes up to higher elevations. The formation under the village is glacial gravel. There is a strong spring of water flowing from the east bank of the creek, only a few yards from the northeast corner of the village.

Over observed 24 lodges in the village but could not locate the burying ground. He found a boulder fragment just east of the trench on which figures of hands were pecked and 80 rods west in Mr. Larson's cultivated field, a larger boulder showing two hands (Over 1973:299). Over concluded that the village was of Arikara origin, of short habitation, fortified for protection, and possibly built by the inhabitants of Friswold village (1 mile north) near the end of their occupation as a refuge from an enemy (Over 1973:303,346).

The Smithsonian River Basin Survey recorded the site in May 1953 and assigned the number 39WW2. At that time, they described the site as a small, well-preserved fortified earth lodge village in the vicinity of Mobridge, S.D. located at the edge of the first terrace above the Missouri River floodplain at an elevation of 1580 feet. References were made to W.H. Over's notes and to T.H. Lewis.

Excavations at the Larson site in 1963 and 1964 by Alfred W. Bowers revealed an early Woodland horizon largely destroyed by the later proto-historic occupation (Bowers 1967:205).

> Unlike most earthlodge sites, it was situated away from the river channel and the population relied on a large spring nearby for their water. The site was strongly fortified with a ditch and remnants of an older ditch could be traced. It had been burned several times. Burials were found in three lodges but cache pit burials were also common. The site seems to be the end of a local tradition long in existence near the Grand River.

Excavators found twenty-nine circular depressions within the stockade and ditch fortification; of these, they trenched ten and completely excavated two. Evidence showed that the lodges had been rebuilt several times and each time reduced in size. During the last occupation, human bodies were strewn on the lodge floors - thirty skeletons in one house, eight in another, and disarticulated remains in the other lodges.

J.J. Hoffman of the Smithsonian River Basin Surveys conducted further excavation at the Larson village in 1966, digging a 150 foot long trench and revealing two fortification ditches, at least three houses, some cache pits, and other structural features (Owsley, Berryman and Bass 1977:119).

The University of Kansas, under Dr. William M. Bass, excavated of ninety-five human burials from the Larson village cemetery during the summer of 1966. The village fortification was built up of earth taken from the aboriginal diggings. The outer circle showed no structural features and very little cultural material. The inner circle had postholes and pocket caches, one of which contained the burial of a young canid; and the fill included many disarticulated human skeletal remains. There was no indication of purposeful or orderly interment nor were there any accompanying offerings. The few artifacts which came to light confirm allocation of this circle to the Little River focus (Evans 1967:218).

Burials were very similar to those at Leavenworth (on the west bank of the Missouri just north of Anton Rygh (39CA4), which was an historic Arikara village)(Jantz 1970; Jantz, quoted in Deitrick 1973:75). The Larson burials, however, showed a greater preference for the flexed position with few associated artifacts.

Analysis of the skeletal material recovered at Larson (71 individuals identified within the village and 621 skeletons excavated from the cemetery) "firmly establish that intertribal warfare explains the unburied village skeletons" (Owsley, Berryman & Bass 1977:126). From these data, Owsley, Berryman & Bass (1977:119) suggest that the Arikara occupied the site from about AD 1750 to sometime before 1785.

In 1991, the U.S. Army Corps of Engineers, Omaha District (COE Omaha) conducted an archaeological data recovery program at the site. By this time, Larson had been subjected to a hundred years of disturbance - from uncontrolled digging by pot hunters and the use of the area for agriculture, to archaeological excavation, to general inundation by the waters of the reservoir, Lake Oahe. Data recovery was possible in 1991 because the water level dropped low enough to permit a controlled surface collection over part of the village (an area 210 meters north-south by 150 meters east-west; see Figure 5).

The survey was a controlled surface collection in an area 210 meters north-south by 150 meters east-west marked into 30 meter square grids (Figure 6). Volunteers walked measured transects (5 feet apart) both east-west and north-south, collecting all they saw. It is not known whether the crew made field notes of the survey.

The survey's purpose was to gather sufficient data to nominate the Larson site to the National Register of Historic Places. Pertinent data consisted of determining site limits, chronological position, extent of intact cultural features, and sampling of cultural material.

In 1991, COE Omaha archaeologists did preliminary processing of the material collected (washing, sorting, preliminary classification and cataloging) and stored the sorted artifacts in plastic ziplock bags. Each bag had the site number, SARC accession number and a catalog number (i.e. for the bag), provenance (grid number) and collection information, and a general description of the contents. The laboratory staff also labeled a small portion of the artifacts (approximately 10%). COE Omaha prepared a revised catalog in 1994.

In 1995, COE Omaha contracted ARCHLAB to analyze the materials collected in 1991, prepare these materials for curation (and public display where suitable) by SARC, write a detailed analytical report about the 1991 collection and complete the National Register nomination forms.

ANALYTICAL GOALS

As specified in the Scope of Work, ARCHLAB was to (1) examine all records, site reports, field notes, maps, plans, and profiles pertaining to the work conducted during 1991; (2) correct accession deficiencies according to the state standards for all artifacts analyzed under this scope; (3) identify, describe and measure all unanalyzed materials; (4) photograph diagnostic (partial or complete) and unusual artifacts and prepare a short descriptive paragraph suitable for public display; (5) prepare a detailed analytical report; and (6) complete National Register nomination forms.

II. PREPARATION, PROCESSING AND CURATION OF THE COLLECTION

ARCHLAB began the analysis of the Larson collection by removing it from its storage boxes, cross-checking catalog entries to the bags, and comparing catalog descriptions with the material in the bags. The corrected catalog was entered into a database. Small research teams then analyzed the material under each artifact class.

Curatorial assistants cross mended and repaired broken artifacts where practical. ARCHLAB supplied and labeled new zipper plastic bags where needed, obtained archival quality storage boxes of various sizes, and packed the artifacts for curation at SARC.

STATE OF THE COLLECTION

The Omaha District furnished all available materials from the 1991 data recovery program at the Larson site for the analysis. This included artifacts, grid notes, catalog sheets (original and revised), maps, plans, and photographs.

ARCHLAB received twenty cartons of artifacts on April 5, 1995. According to the inventory supplied, the collection contained ceramics, lithics, other stone tools, debitage, FCR, clinkers, and other stone, scoria, bone tools, other bone, shell, metal objects, and a few trade items and later Euroamerican material (beads, and single items of plastic, leather, and wood).

The shipment included a copy of the revised catalog. Over the next several months, additional material arrived: field notes, a sketch map of the grid and field photos. On September 6, 1995, ARCHLAB received the last of the available records from COE.

The initial examination of this collection revealed some serious deficiencies. First, there was a major discrepancy in the amount of material in the collection between the inventory supplied with the collection and the actual tally as determined by ARCHLAB.

Inventory supplied with collection/ARCHLAB inventory

ceramic rim sherds	1504/1293
ceramic body sherds	9197/15659
historic sherds	6/10
daub	4/1
projectile points	112/151
other stone tools	376/308
debitage	2994/3195
FCR, clinkers etc.	100/125
bone tools	229/66
other bone	1038/13398
shell	56/75
metal	28/52
beads	8/8
plastic	1/1
leather	1/1
wood	1/1
TOTALS:	15655/34344

DISCREPANCY: 18,689 items (additional)

Second, only about ten percent of the artifacts had been labeled and accessioned, presenting a significant mass of material still to be processed. Third, some individual catalog entries represented large numbers of objects (e.g. one bag having 735 sherds under one catalog number). This was an especially serious problem, in that SARC's curation guidelines had changed between 1991 and 1995 and now stipulated that all artifacts had to be individually cataloged and labeled - an unreasonable task, given the actual size of the collection (as compared to the original inventory), the representation of the workload in the scope of work, and the expectations of both COE Omaha and ARCHLAB.

MITIGATION OF ACCESSION DEFICIENCIES

All discrepancies and other cataloging problems had to be resolved. Incorrect or incomplete identifications and category changes (e.g. from debitage to stone tools, unmodified to modified bone) required corrections or amendments to the catalog and relabeling of the artifacts. After negotiation (pers. comm. Renée Bowen, SARC curator of collections), SARC allowed ARCHLAB to leave individual body sherds, unidentified bone, and debitage unlabeled and with their original cumulative catalog numbers (i.e. they could be kept in their original bags). Fortunately, this meant that most of the additional material (17,610 body sherds and unmodified (i.e. other bone) did not have to be individually cataloged and labeled. Each of these items, however, still had to be analyzed for primary identification (or verification) purposes.

It was also necessary to change a number of labels which bore the old, unrevised catalog number (i.e. prior to COE catalog revisions in 1994), correct others, and label those artifacts needing labels (under the SARC agreement). Some old labels were impossible to remove since they lacked a base coat of clear fingernail polish. Where analysts found catalog numbers which grouped together different materials (e.g. bone and shell or different lithic types), they subdivided these entries so that each class of item had a unique number.

In spite of these problems, ARCHLAB assigned accession and catalog numbers to all relevant artifacts according to South Dakota state standards, corrected the site catalog as needed and entered the data into the HACS database format as required by SARC.

III. ARTIFACT ANALYSIS

The analysis of cultural material from the Larson site required the integration of several analytical systems: the COE Omaha classification the material in 1991 (with revisions in 1993), the analysis system used by ARCHLAB in all material culture studies, the approach of Calabrese (1972) to material culture analysis, and the classification system required by SARC. The goal of the analysis was therefore to adapt the archaeological classifications made during the initial survey and laboratory processing to the ARCHLAB's analytical system, interpret the material according to the COE Omaha guidelines, and then present the data in the collections management classifications required by SARC. This approach, although complex, effectively accomplished the analytical and interpretive goals of the project.

COE Omaha designed its classification of the cultural material to show the technological variability in the sample and so yield a body of information from which analysts (in this instance, ARCHLAB) could make inferences regarding cultural history, chronological placement and identification of functional activities that took place at the site in question. The Larson site material posed a special problem, however, as it was collected from an eroded ground surface and therefore lacked spatial and temporal integrity. Spatial data were limited to the most basic assumption (perhaps unwarranted) that the surface material was roughly in the same location as it was when undisturbed; and temporal data were confined to what assumptions could potentially be made about the age of diagnostic projectile points and ceramic wares, based on comparisons to other sites. ARCHLAB's research goals were therefore more limited than they would have been in the study of material excavated from a previously undisturbed context, but entirely consistent with the level of information available.

It should also be noted that the specified analytical tasks (in the Scope of Work) were designed for excavated sites. As the Larson material came from an eroded surface, certain types of material (e.g. organic samples and carbon) could not provide any meaningful information and, therefore, were not analyzed beyond basic catalog verification.

1. CERAMICS

The analysis of ceramics from the Larson site (39WW2) followed the type/variety approach, incorporating measurements recommended by Calabrese (1972). Ceramic identification followed the nomenclature presented in Butler and Hoffman's (1992) categories for Plains ceramic types and wares for sites with ceramics in the project area. The categories discussed by Butler and Hoffman consist of named wares and accompanying types organized by major geographic area. This typology is presented by the authors as tentative, reflecting the lack of consensus in Plains ceramic classification (Butler and Hoffman 1992:8), but it provides a basic structure within which refinements can be made according to the area under study.

The 1991 surface collection provided to ARCHLAB consisted of 16947 ceramic specimens (15659 body sherds and 1293 rim sherds). The latter category included 49 strap handles (Plate 47) and one '**effigy face**' lug (Figure 7).

ARCHLAB analysts studied rims, the most diagnostic portion of the vessel, *en masse*. They selected a sample of body sherds (a 10 percent sample of each bag); these sherds were repacked in their original bags after study.

ARCHLAB sampled body sherds for two main analytical reasons: 1) they did not provide information relative to major project goals (age and cultural attribution) that could be provided by rim sherds; and 2) any interpretations (e.g., culture change, cultural interactions, intra-site spatial associations, comparative analyses, and so on) typically available from a detailed analyses of individual sherds found in their original context were not feasible, due to the surface provenance and the history of site disturbance, coupled with its periodic inundation. In addition, these sherds were vastly more numerous than represented in the original inventory, and so their analysis was not budgeted.

Some data, however, are available from an out-of-context collection, such as determination of decoration, surface treatment, temper and so on. These types of data are useful for assessing cultural affiliation and chronology on a general basis. Such information can be drawn from sampling. The population of body sherds in the Larson collection was of sufficient size (n=15,658) to allow a 10% sample. A sample size of 10% is typically regarded as statistically representative of such a large population. Therefore data gleaned from the sample provided reliable information on the nature of tempering and surface treatment/decoration throughout the collection.

The 1293 rim sherds represented 7.63% of all ceramic sherds. Their classification followed categories established by Hurt 1957; Smith 1977; Lehmer 1954; Lehmer and Jones 1963; and Calabrese 1972. Of these, 1287 (99.6%) were assigned to one of three wares: **Stanley Braced**

Rim, Le Beau Ware, and Talking Crow Ware. These wares are groups of types which share a majority of basic characteristics, including the fabric of the pottery, the surface finish, and the basic rim form. The types are primarily groups of similar rim shapes, all decorated in more or less the same way (Lehmer 1954).

Rim sherd measurements were based on the scheme outlined by Calabrese (Calabrese 1972). Straight rims were measured for total rim height and rim width, while the S-Rims were additionally measured for the heights of the upper and lower portions of the S-Rims.

Every rim sherd (and the body sherd sample) was carefully examined for **temper** composition. The temper, in all the samples, was grit derived from decomposed granite. Such temper is predominantly quartz, with traces of feldspar and mica. The grit was fairly visible to the naked eye, and in some cases protruded above the surface. The average grit diameter was 1.9mm, with diameters ranging from 1.5mm to 2.75mm. The **texture** of the sherds was medium to coarse, often with internal cleavages parallel to the vessel wall. The **color** varied from gray to buff to yellowish tan. The majority of the exterior surfaces, both of rim and body sherds, were blackened by a carbon deposit. Firing clouds were evident on both interior and exterior surfaces, but more commonly on the exterior.

Analysts studied a total of 1586 body sherds (the sample was slightly higher than 10% of the total population because the nature of the collection and the processing routine necessitated sampling from individual bags). Most of the sherds (1576) fell into one of seven categories: **plain, trailed, incised, check stamped, simple stamped, brushed, and cord-impressed.** In addition, there were several **tool-impressed** sherds and **cord-wrapped stick** sherds.

Trailed and incised sherds consist generally of horizontal lines. They may be distinguished by the relative width and depth of the impressions and the intervening spaces and by the nature of the impression itself. Simple stamped sherds are impressed with either a paddle carved in a series of parallel ridges, or one wrapped with strips of some smooth material, such as leather. Brushed sherds have sharply defined parallel scratches, apparently made with a handful of stiff coarse grass or a corn cob. Plain and simple-stamped sherds tend to be smoothed, but not polished (Plate 48).

A few sherds in the sample were comparatively rough and some had random striations. About one percent of the body sherds had an ocher-colored slip applied on the interior surface.

RIM SHERD ANALYSIS

In describing the pottery, characteristics common to all of the types assigned to one ware are listed under the ware description; characteristics specific to a particular type are entered under that type (see Plates 40-46; Figure 7).

TALKING CROW WARE: n=904 (70.02%)

Age: Late Initial Coalescent through Extended Coalescent and Post Contact Coalescent Variants, ca. AD 1450 - 1780. Smith (in Butler & Hoffman 1992:48) states that with the exception of Taking Crow Straight Rim, Talking Crow wares are good markers for the earlier part of the Post Contact Coalescent.

Distribution: Middle Missouri Subarea, central Nebraska, western South Dakota, northeastern Wyoming, northeastern Montana.

General form: Rims are straight to slightly flared, with rounded and thinned lips (see Smith 1977: 55-9)(Plate 40). The lips do not show any signs of bracing.

General decoration: Decoration varies with the ware type (see below), appearing both on the lip and on the exterior rim surface. Most lips are either cord-impressed, notched, or indented. Some lips are plain. On a few sherds, the lips are distorted by finger pressure.

Larson site types: Talking Crow Cord-Impressed; Talking Crow Brushed; and Talking Crow Straight Rim.

Talking Crow Brushed: n=373 (28.9%)

Form: The rims are straight to slightly flaring (Plate 40). Rim height ranges from 7.58mm to 86.47mm. with an average height of 32.01mm. Lips are rounded, rarely flattened, and are usually of the same thickness as the lower rim. Rim thickness averages 7.13mm.

Decoration: Some lips are notched on the inside. Others are distorted by finger pressure. The lower rim is always brushed. The brushing is almost always at an angle, sloping from left to right. This kind of brushing may be replicated by scraping soft clay with a corncob (Smith 1977: 57).

Talking Crow Straight Rim: n=348 (26.9%)

Form: The rims are straight to slightly flaring. Rim height ranges from 9.27mm to 50.32mm, with an average of 24.11mm. Lips are usually flattened, and often slightly thickened. Rim thickness averages 6.92mm.

Decoration: Almost all the rims are plain. The few exceptions show evidence of being trailed. Lips are mostly indented. The design is usually diagonal, to the right or left, but a few have a herringbone pattern (i.e. multiple chevrons).

Talking Crow Cord-Impressed: n=183 (14.2%)

Form: Rims are straight to slightly flaring. Rim heights range from 8.61mm to 51.40mm, with an average of 23.63mm. Lips are rounded, and are often thicker than the lower rim. Rim thickness averages 6.53mm.

Decoration: The lips and lower rims are cord impressed. This is mostly confined to the exterior, but some examples have cord impressions on their interior. On the lips, cord impressions are concentric, running around the mouth of the vessel. The lower rims have horizontal cord-impressed lines.

STANLEY BRACED RIM WARE: n=192 (14.9%)

Age: Post Contact Coalescent Variant, ca. AD 1675 - 1780 (Ahler & Toom 1989); possibly late Extended Coalescent Variant.

Distribution: Middle Missouri Subarea, South Dakota Badlands.

General form: The vessels have straight to slightly flared rims with a distinctive bracing (Plate 41). The potter made the braces by adding a fillet of clay from the lip down onto the outside of the lower rim. The top of the fillet blends into the lip; the bottom of the fillet sometimes stands out from the lower rim. The lip is generally rounded and thicker than the lip found on Talking Crow Ware, but some rims have sharp or flattened lips.

The vessels have strap handles. These handles extend from the bottom of the bracing fillet to the bottom of the lower rim.

General Decoration: Decoration varies with the ware type (see below), appearing on the lip, lower rim, and strap handles. The main decorative technique is cord impression. The Stanley Wavy type has lips that are distorted by finger pressure. Of the 50 handles in the collection, 49 are the Stanley Cord-Impressed type.

Comments: firmly identified with Arikara groups.

Larson site types: Stanley Cord-Impressed; and Stanley Wavy Rim.

Stanley Cord-Impressed: n=189 (14.6%)

Form: The rims are all straight or slightly flared, and are braced with a fillet of clay. The lips are usually rounded; a few are flattened. Heights for these rim types range from 9.06mm. to 63.19mm, with an average of 25.33mm. Rim thickness averages 6.47mm.

Decoration: The rims are cord-impressed on the lips, the rim exterior, and on the handles. The designs tend to be horizontal on lips, handles and lower rims, but some specimens have additional horizontal or diagonal cord impression on the lips.

Stanley Wavy Rim: n=3 (0.3%)

Form: The rim and lip forms are similar to the Stanley Cord Impressed Type. Rim height ranges from 21.00mm to 54.67mm, with an average of 33.43mm. Rim thickness averages 7.06mm.

Decoration: This type has a series of alternating indentations on the interior and the exterior of the lip and rim, apparently made by pressing the plastic clay with the thumb and forefinger, one inside and the other outside the vessel. This technique produced a wavy or sinuous effect, which is especially visible from above (Lehmer 1954: 43-44)(Plate 41).

LE BEAU WARE: n=185 (14.3%)

Age: Extended and Post Contact Coalescent Variants, ca. AD 1500 - 1780 (Ahler & Toom 1989)

Distribution: Middle Missouri Subarea.

General form: The rim for all but one type (Le Beau Punctated) is S-shaped. Lips can be straight, slightly wavy, thickened, or extruded.

General decoration: The surface has vertical or horizontal brushing on both upper and lower rims. The brushing is usually smoothed down on the upper surface for design application. The decoration depends on the ware type (see below), ranging from vertical and diagonal (right to left) incisions to horizontal cord impressions to punctates.

Comments: Le Beau Ware is very similar to Stanley Braced Rim Ware temporally, stylistically, and in its geographic spread. The main difference between the two is the presence or absence of a braced rim. This difference is not very clear, however, for some thickened and rolled rims of the Le Beau Ware type sample are transitional to the Stanley Braced Rim (Hurt 1957: 37).

Larson site types: Le Beau Incised, Le Beau S-Rim, Le Beau Cord Impressed, Rygh Rainbow Corded, and Le Beau Punctated.

Le Beau Incised S-Rim: n=84 (6.5%)

Form: Rims are curvilinear to very gently S-shaped (Plate 42). They range in height from 16.31mm to 84.54mm, with an average of 38.16mm. Rim thickness averages 7.38mm. Lips are most commonly rounded and undecorated.

Decoration: Rims, and sometimes lips, are decorated with incising and broad trailing, both at times combined with punctates. Design technique is highly variable, featuring horizontal incisions, vertical incisions combined with diagonal punctating, herringbone punctating, opposed diagonals both incised and Punctated, and horizontal trailing.

Le Beau Horizontal Cord Impressed S-Rim: n=29 (2.3%)

Form: S-Rims of this type vary in height from 16.39mm to 54.43mm, with an average of 29.64mm. Rim thickness averages 6.71mm. Lips vary from rounded, extruded and wavy to T-shaped.

Decoration: The most common design is a series of horizontal single-line cord impressions, varying in number from four to eight.

It is possible that some very small sherds may actually be fragments of another cord-impressed type, Rygh Rainbow Corded. Most, however, are large enough that the presence of the distinctive 'rainbow' pattern would be visible.

Rygh Rainbow Corded S-Rim: n=4 (0.7%)

Form: The rims are S-shaped, ranging in height from 18.36mm to 32.92mm, with an average of 25.26mm (Plate 43). Rim thickness averages 5.68mm. All four specimens have rounded lips, one of several type identified by Hurt (Hurt 1957: 42).

Decoration: The decorative technique is similar to that of the Le Beau Horizontal Cord Impressed type. All four specimens show the most common design: a circular rainbow framed by horizontal cord impressions.

Le Beau Plain S-Rim: n=60 (4.7%)

Form: Rims are s-shaped to outward flaring. Rim heights range from 11.36mm to 70.03mm, with an average of 32.00mm. Rim thickness averages 6.98mm. Lips are thickened and sometimes rolled over to give a ring effect.

Decoration: None.

Le Beau Punctated: n=8 (0.62%)

Form: Rims are straight to flaring, in contrast to the s-shaped rims of the other four Le Beau rim types from the Larson site. Rim heights range from 28.90mm to 50.83mm, with an average of 35.45mm. Rim thickness averages 6.44mm. Lips are generally rounded; a few specimens are flattened.

Decoration: The design is applied by a tool such as a dull-pointed awl. It is highly variable, featuring double or single rows of diagonal punctations applied to the upper exterior of the rim.

COLOMBE COLLARED RIM WARE: n=4 (0.7%)

Age: Post Contact Coalescent, ca. AD 1675-1780 (Ahler & Toom 1989).

Distribution: Southern portion of Middle Missouri Subarea.

General Form: Rims are collared, with the lower edge of the collar marked by a fairly abrupt shoulder which forms the junction between the collar and the low curved neck (Plate 44). The lower edge of the collar is plain. Rims range in height from 41.41mm to 62.26mm, with an average height of 54mm. Lips are slightly thickened by folding and welding.

General Decoration: Decoration is confined to the lip and collar, and consists of horizontal impressions.

Larson Site Types: Colombe Tool Impressed.

OTHER RIM SHERDS

Eight sherds not conforming to any of the wares listed above were recovered from the Larson site.

UNIDENTIFIED EFFIGY FACE: n=1 (.08%)

One small sherd, part of a lug, has an 'effigy face' sculpted on the outer surface (Figure 7). The face is 18.73mm long and 8.1mm wide at eye level. The potter pinched the clay at the lug to form the nose and cheeks, made two small punctates for the eyes, and formed the down-curved mouth and teeth with a small, curved and sharp object. Incised hatching on the top and sides of the head may represent hair, but these elements are probably extensions of the lip decoration. A published example of a similar effigy lug (although the photograph is small and the detail is unclear) is a sherd of Le Beau Cord Impressed ware found at the Cross Ranch site (32OL14) in the Knife-Heart region of North Dakota (Calabrese 1972: Plate 3d).

Given the range of variation in the major wares found at the Larson site, this representation may simply be an idiosyncratic expression within one of the regional styles, such as Le Beau Incised S-Rim.

IONA WARE: n=6 (.46%)

Several sherds exhibit characteristics similar to various types of Iona Ware (as described, for example, by Smith 1975 and Smith 1977)(Plate 45). Due to the small size of the sample, a more precise attribution cannot be made. The vessels are regarded as intrusive (i.e. they were not likely manufactured at the site) and are not described in detail.

Age: Extended Coalescent Variant, ca. AD 1500 - 1675 (Ahler & Toom 1989).

Distribution: Southern portion of Middle Missouri Subarea.

UNIDENTIFIED PAINTED WARE: n=1 (.08%)

One painted sherd was recovered from the Larson site (Plate 46). It is a straight rim, thickened at the top and finger-impressed, in the manner of Le Beau Finger Indented (Hurt 1957). The paste is fine-grained and the temper is a very fine quartz sand. The surface is smooth and evenly fired, with a light tan color. The design fragment consists of the top of two shapes: a pointed, diagonal black line, running down from right to left, 1.4mm wide, painted to near the top of the rim; and a flat-topped shape, 2.7mm at the top, expanding downwards left and right to 7.67mm (where the right side of the fragment ends). It is assumed that this sherd was imported from outside the Middle Missouri region, possibly from the southwest.

2. LITHICS

ANALYTICAL PROCEDURE

Lithic analysis involved several stages: examination of the collection, analysis of the material, and interpretation.

In the first stage, the analysts pulled all lithics from their boxes, separated the bags by their labeling (tools or flakes), and checked each bag against the catalog to verify the contents. This involved checking for errors in artifact count or numbering, correcting inconsistencies or omissions in descriptive data, and verifying the general artifact type.

The analysis focused on the classification of tools and debitage. As ARCHLAB's task was confined to work on a previously collected artifact inventory, we modified our in-house typology to accommodate the artifact classes specified in SARC's Hierarchical Artifact Classification System (HACS).

GENERAL LITHIC CLASSIFICATION SYSTEM

ARCHLAB's classification of lithics is consistent with current approaches that concentrate on elements of form, technology and function. It is a pragmatic system that provides data about the use of lithic implements suitable to the nature of Phase I survey projects and provides the basic data for further research.

Rock can be assigned to one of four general categories based on a three stage analysis. The first stage is a division of the lithic assemblage into chipped stone, prepared stone, altered stone and introduced rock. Chipped stone includes all rock which has been intentionally modified for use by the removal of flakes. Prepared stone includes all rock on a site which has been intentionally modified for use, but not knapped. This includes ground stone artifacts, such as mauls, abraders and catlinite pipes. Altered stone includes all rock on a site which has been altered by use, but not intentionally modified. This includes hammerstones, some grinding stones and fire-cracked rock. The chipped stone is then divided into formal tools, cores and debitage - the latter three categories based on the presence or absence of retouch. Formal tools are further subdivided by the type of edge retouch present - invasive (facial) and marginal. Retouch may be defined as consistent flaking along the edge of a specimen.

This approach allows the formation of hypotheses about the production goals of the site inhabitants (e.g. knappers may have been involved in unintensive core reduction, intensive core reduction, and tool manufacture). Such variation in production may contribute to an overall understanding of the pattern of activities conducted at a site.

Chipped Stone

The classification of chipped stone tools relies on a modified version of the analytical system developed by Chapman (1977) from a variety of sources (e.g. Calabrese 1972). The classification system for debitage is derived from Sullivan and Rozen (Sullivan and Rozen 1985; Rozen and Sullivan 1989), with modifications to accommodate the SARC classification system.

Retouched Pieces [Tools]

Formal tools have evidence of intentional shaping, with consistent flaking along edges.

Tool types are distinguished by the length of retouch scars relative to the area of the working surface. In invasive or facial retouch, the scars extend from the edge over one-third or more of the tool surface. In marginal retouch, the scars extend from the edge over less than one third of either surface. Invasive retouch results in considerable alteration of the shape of the piece.

Within these two categories of retouched tools, several functional tool classes are defined on the basis of overall shape, placement of working edge, edge shape or edge angle, and evidence of edge damage.

Tool types and functions

The classification of a tool largely depends on the stage (in processing or use) it reached when it entered the archaeological record - from raw material and cores through utilized flakes, the fashioning of preforms and finished tools, to the reworking of one tool type into another.

Tool types may have cultural or functional significance, such as projectile points and end scrapers, or, like blanks and preforms, they may represent technological stages in the tool manufacturing process.

Identifying tool function may be difficult. A biface begins as a blank and may be made directly into a projectile point or knife, but it is also possible that a knife may become the preform for a projectile point or other tool. Tools may also serve a variety of functions, such as a projectile point that is used as a knife or scraper.

The intended function of a tool may be derived in part from the shape and angle its working edges. Forms with bevelled edges tend to be interpreted as scrapers while thinner symmetrical forms are commonly interpreted as cutting edges (cf. Isaac 1977)(Plate 50). A tool with a small pointed edge (a projection) may have been used as a graver, and one with a concave edge may have been a spokeshave.

Edge damage on tools may provide evidence of their use. This 'use wear' is distinct from the use wear visible at high magnification (i.e. under a scanning electron microscope). Microscopic use wear is the polish, abrasion and other microscopic features produced when the tool is used with specific materials, such as flesh, hide, bone, wood or plant material. ARCHLAB interprets the category as the macroscopic examination of step fracture, attrition, polish and battering, elements that are visible to the naked eye or with a hand lens. Calabrese (1972) does not deal with this aspect of tools - the analysis of 'use wear' was in the early stages of development at that time. The analysis of wear at a macroscopic level is, however, highly problematic (Young and Bamforth 1990), as some of these attributes may have been caused during manufacture (e.g. a step fracture, caused when a flake terminates abruptly in a 'hinge' rather than feathering outward to its proximal end) or other cultural activity (e.g. trampling) or by natural agency (e.g. impacts during redeposition).

The practical approach used here is to classify the tool according to its principal functional category, based on an analysis of its shape, and attempt to determine its age and cultural attribution by comparison with types established in the archaeological record for the Midwest.

Bifacial Tools

Bifacial tools have the removal scars of large thinning and shaping flakes on two surfaces. Formal attributes and the interpretation of use provide the basis for several functional classes.

Projectile points are symmetrical bifaces with hafting modifications such as side or corner notches, a basal stem or shoulder, or thinning of the base by removal of one or more large flakes. Bifacial tools that resemble projectile points but have no hafting modifications are included in this category. At Rodgers Shelter, Ahler (1971) suggests that tools generally classified as projectile points exhibit wear patterns associated with other usages; conversely, it is possible that wear patterns indicative of hafting may occur on nondescript triangular flakes, suggesting their use as projectile points. Small, symmetrical, triangular bifaces with or without hafting modification, whose distal margins converge to a point are referred to as arrow points.

Bifacial knives are thinned, unstemmed bifaces, generally with a triangular or ovate form, with thin cutting edges. A bifacial knife may have at least one edge with attritional wear, but such wear may also result from platform preparation or fine retouching, or from use as a scraper.

Bifacial scrapers have steep marginal retouch. Such tools may be adapted from other tools, such as projectile point preforms or reworked points.

Bifacial Blanks

Bifacial blanks are pieces not fully worked, such as unfinished tools and tools broken during manufacture, bifaces discarded due to flaws in the raw material, or preforms (tools intended for later reduction into points or knives).

Unifacial Tools

Unifacial tools are mainly retouched on only one surface. Many unifacially modified tools are end scrapers. These tools have ovoid to subtriangular outlines with a steeply angled, outwardly curved working edge and flaking over most of the dorsal surface.

Marginally Retouched Tools

Tools are marginally retouched when the modification extends along more than one third of the perimeter of the tool. Marginally retouched tools include flake scrapers and perforators (e.g. drills, borers). Flake scrapers generally have a steep angle of retouch, whereas perforators have a projection suitable for piercing.

Edge-Modified Tools

Edge-modified tools are generally flakes that exhibit marginal retouch along one or more edges. Such tools are usually subdivided into debitage categories such as modified flakes or modified chunks. Such tools will generally see one episode of use and will rarely be curated or maintained.

Utilized Flakes

Flakes are considered 'utilized' if one or more edges display concentrations of small step fractures. Although not a formal tool, as the specimen does not exhibit intentional flaking, utilized flakes are subsumed within this category under the assumption that the knapper produced such flakes for the express purpose of using them as tools. Few flakes are assigned to this category, as such fractures may be produced by other cultural or natural factors (see Young and Bamforth 1990).

Cores

'Cores' are identified based on the absence of positive percussion features (such as bulbs of percussion or platforms) and the presence of negative percussion features (Rozen and Sullivan 1989:181). The term 'core' implies nothing about the intention of the flintknapper. That is, cores may have been used as tools (or intended for use); or they may represent parent material for producing useable flakes; or they may be the unusable byproducts of such flaking. Flakes may be removed by either direct or indirect percussion. Several morphological classes are commonly recognized based on the size, shape, degree of platform preparation and flake scar patterning observed: block cores, tabular cores, and nodular cores (and in the HACS classification system used by SARC, multifaceted, polyhedral, bipolar, biface, and check cores).

Prepared cores exhibit systematic platform preparation for the removal of lamellar or parallel edged flakes. They tend to be pyramidal in shape because of the pattern in which flakes have been removed. These differ from true blade cores in that the negative flake scars tend to be less parallel-sided and not as elongated.

Core nuclei are worn out or exhausted pieces of chert which exhibit negative flake scars. Given the small size and degree of reduction, it is not possible to determine whether they were derived from any of the types described above.

Reduction fragments (or core shatter) are pieces that exhibit evidence of both systematic flake removal and natural, angular cleavage planes. As opposed to the other types described above, these specimens are amorphously shaped and are probably sections of larger block cores or tabular cores that prematurely fractured along pre-existing planes.

Debitage

Debitage consists of the unused byproducts of toolmaking - generalized waste flakes and shatter detached by direct or indirect pressure flaking or percussion flaking during the reduction of cores and manufacture of chipped stone tools. Such unworked flakes or fragments have positive percussion features but lack evidence of post-detachment modification such as intentional retouch or utilization.

Debitage can be broken down into four categories (Sullivan and Rozen 1985). Items are assigned to specific categories based on a hierarchy of three simple observations, or "dimensions of variability" (Sullivan and Rozen 1985:758-59), and recorded as 'present' or 'absent'. The first observation is the presence or absence of a single interior surface, commonly referred to as the ventral face. An interior surface is indicated by ripple marks, force lines, or a bulb of percussion. The point of applied force is the second variable; it requires the presence of the striking platform or a remnant of it. Margins constitute the third dimension of variability. Margins are considered intact if the distal end retains features of the flake termination, and lateral edges permit accurate width measurements.

These categories are not diagnostic of specific stages of lithic reduction or manufacturing. The determination of debitage classes is, as Sullivan and Rozen note, arbitrary and subjective, and does not accurately reflect stages in the manufacturing process (Sullivan and Rozen 1985:756). Hence, the traditional classification of flakes by production stages (i.e. primary, secondary or tertiary) is inconsistent with Sullivan and Rozen's typology. In a more generalized lithic analysis such as the present analysis of the Larson collection, however, the identification of decortication stages may have some relevance with respect to the intensity of lithic production (e.g. a predominance of primary flakes, with extensive cortex, may indicate that the main activity was raw material testing or core preparation).

It should be noted here that variability in raw material, in its response to percussion, and in knapping techniques, creates an inconsistency in production that makes it difficult to speculate about distinct production goals. Differences in the distribution of debitage among Sullivan and Rozen's categories at different sites or groups of sites in the Southwest have been used to argue for distinctive flintknapping goals (Sullivan and Rozen 1985). For instance, sites dominated by cores and complete flakes have been interpreted as places where the production of useable flakes was the most important goal. These arguments have been challenged by recent results of some lithic reduction experiments (e.g. Mauldin and Amick 1989; see Shott 1994 for a review).

Following this hierarchy, debitage can be subdivided into complete flakes, broken flakes, flake fragments and debris (shatter).

'Complete Flakes' exhibit a single interior surface, striking platform and intact margins. 'Broken Flakes' have a single interior surface and a striking platform or platform remnant, but lack intact margins. 'Flake Fragments' exhibit a single interior surface, but lack the striking platform and intact margins. Debitage that lacks all three dimensions of variability is classified as 'Debris'. Typically, debris is irregular in shape and bears little or no evidence of conchoidal fracture (although some debris may actually be unidentifiable flake fragments). Debris may have resulted from breakage along a rock's natural cleavage planes, excess force applied during lithic reduction, heat treatment, treadage, or noncultural factors such as freeze-thaw action.

In addition to the four categories described above, flakes may be characterized as bifacial trimming flakes (or thinning flakes), recognized by the presence of multifaceted platforms which exhibit characteristic 'lipping' of the striking platform over the vertical surface of the flake. These elements are very thin and possess small negative flake scars in their dorsal surface; they are representative of the final stage of lithic tool manufacture and maintenance.

As noted above, the presence or absence of cortex is also noted for each specimen. Cortical flakes (or decortication flakes) represent the intermediate stages of lithic reduction and tool manufacture, and give an indication of site function.

RESULTS OF LITHIC ANALYSIS

A. CHIPPED STONE

Projectile Points

The surface collection yielded 151 small notched and un-notched triangular projectile points and point fragments (Plate 49). There are 30 complete or nearly complete points on which it was possible to record 12 interval measurements and raw material type, following the methodology developed by Calabrese (1972) for the small point tradition at the Cross Ranch site. The remaining 119 points are fragments (tips, midsections, and bases) for which it was not possible to record these variables.

From the sample of 30 complete or nearly complete projectile points, 8 are side-notched and the remaining 22 points are triangular (un-notched). Measured variables are listed in the two tables below for each of these two groups, together with means and standard deviations for each variable.

Means and Standard Deviations of Notched Projectile Points

Variable (letter code corresponds to Calabrese 1972)	Larson Mean (n=8)	Larson Standard Deviation (n=8)	Cross Ranch Mean (n=18)	Cross Ranch Standard Deviation (n=18)
a maximum length	22.79	4.35	23.78	4.29
b blade length	16.18	3.35	17.27	3.84
c maximum haft length	6.83	1.42	6.61	1.46
d minimum haft length	4.30	1.24	3.78	1.11
f basal contact length	12.04	3.98	8.39	4.53
g blade base width	11.85	2.43	13.00	2.00
h mid blade width	10.53	1.88	9.89	1.53
i maximum width	13.33	1.83	13.28	1.87
j maximum haft width	12.28	3.50	12.72	2.21
k minimum haft width	7.42	0.78	7.89	1.28
l thickness	2.73	0.38	2.89	0.32

Means and Standard Deviations of Unnotched Projectile Points

Variable (letter code corresponds to Calabrese 1972)	Larson Mean (n=22)	Larson Standard Deviation (n=22)	Cross Ranch Mean (n=25)	Cross Ranch Standard Deviation (n=25)
a maximum length	23.91	5.09	28.43	6.71
b blade length	20.77	6.65	28.43	6.71
f basal contact length	13.63	2.66	8.68	4.00
g blade base width	14.60	2.64	11.96	2.07
h mid blade width	11.77	2.45	13.16	2.48
i maximum width	15.14	2.37	14.24	2.20
j maximum haft width	15.29	2.30	12.04	2.05
l thickness	3.52	0.97	3.24	0.78

The notched points all exhibit a high standard of manufacturing, including: full-facial and regular pattern of flaking on both faces; symmetrical plan and cross-section shapes; deep, well-formed notches; and thinned, slightly concave bases. At least one specimen (1123) exhibits serrated blade edges from deliberate, shallow notching. Another point (1128) is serrated along one blade edge (only) as a result of invasive retouch. Six of the eight specimens are made from Knife River Flint and they are also the most regularly manufactured points. Two points are made of chert. Only one point (30) is complete: it is also the smallest (possibly reworked) and is made of chert. On the remaining seven points, one is missing a tip and six are missing ears below one notch.

The characteristics of all of these points fall within the range of variability of Plains Village points (Brown, Brown and Hanenberger 1982), dating to the Late Prehistoric period.

Of 22 unnotched points, seven are complete, seven are missing a tip, four are missing an ear and part of the base, and four have one damaged blade edge. Several specimens (e.g., 43, 1122) with reworked tips also exhibit damage to one face that is consistent with impact damage. Most of the complete points are smaller than the incomplete specimens, suggesting that the complete points have been reworked. Eight out of 15 incomplete specimens are made of Knife River Flint. All of the complete specimens are made from cherts. The fact that the KRF specimens were discarded without further reworking suggests that KRF may have been a more accessible material, at the time and place of discard, than these other cherts.

The characteristics of the unnotched points are consistent with small points dating to the Late Woodland and Plains Village periods in Iowa and the Dakotas (A.D. 500 to 1700) (Morrow 1984, Brown, Brown and Hanenberger 1982). Although the side-notched points are clearly consistent with Late Plains Village cultures, the presence of a Woodland component at the site

(Bowers 1967) creates the possibility that some of the triangular points may relate to this earlier occupation.

Student's *t*-tests indicate that no significant differences exist at the 0.05 significance level between Larson and Cross Ranch data (Calabrese 1972) for any of the 12 variables for notched projectile points. This preliminary comparison of notched points by individual metric dimensions between the Cross Ranch site, as presented in Calabrese (1972:43), and the Larson site, presented here, suggests that these two sets of artifacts belong to the same general population of projectile points. On the other hand, unnotched points at Larson and Cross Ranch are significantly different on three variables ($P<0.001$, $df=45$ for basal contact width [f], blade base width [g] and for maximum haft width [j]). These results indicate that unnotched points from Larson are significantly wider than unnotched points from Cross Ranch, possibly reflecting more extensive resharpening of specimens from Larson (due, perhaps, to differential access to raw material) or the presence of material from an earlier occupation, such as the observed Woodland component (Bowers 1967).

B. PREPARED STONE

Stone Beads

One stone bead was originally recorded in 1991 as 'miscellaneous stone'. Of the two beads, one is complete (weight, 6.9 g), but they are elongated oval beads. The fractured bead (weight, 5.0 g) is split longitudinally, exposing the entire length of the bead hole. The hole appears to contain stains left by ferrous oxidation. The beads were about the same size. The complete specimen measures 36.82 mm in length; its maximum diameter is 14.75 mm.

Stone Abrader

This specimen is made from sandstone, or sandstone-like rock, light gray in color. It exhibits grooves in which bone or wooden shafts were likely smoothed. One end is clearly fractured , which resembles one half of a tube split longitudinally. It measures 33.61 mm in length and has a maximum width of 20.86 mm; it weighs 7.9 g. The uniform groove diameter is about 8.0 mm.

Catlinite

Of the three catlinite fragments, two are probably from pipes. One specimen (wt=7.6 g) has a wide cavity large enough to be from the bowl, and the other (wt=1.6 g), has a narrower groove, likely from the stem. The third specimen (wt=.4 g) is too small to identify. The presence of catlinite is consistent with the adduced age (i.e. post-17th century) of the Larson site.

C. ALTERED STONE

Stone Abraders

One specimen is made from sandstone, or sandstone-like rock, light gray in color. It exhibits grooves in which bone or wooden shafts were likely smoothed. It is an irregularly shaped, multi-faced stone exhibiting two grooves on opposite faces (length, 76.46 mm; weight, 51.6 g). Groove diameters do not exceed 6.90 mm. Unlike the prepared tubular specimen described above (in the Prepared Stone section), this stone was used "as is" for smoothing shafts.

The remaining two abraders are irregularly shaped stones. Neither is grooved, and they were not used in the same manner as grooved abraders. Rather these stones were used by rubbing the stone over the surface to be smoothed. One weighs 21.8 g, and the other 215.2 g.

Fire-cracked Rock

This type of altered stone merits brief attention since there are but two specimens in the collection (wt=98.2 g). They were typed as such by the original investigators.

D. INTRODUCED ROCK

Natural Stone

The original investigators collected several stones that they typed as either 'river pebble' or 'miscellaneous rock'. Two were actually split stone beads, and they are described in the Prepared Stone section. The seven other stones weigh 28.3g total.

Pumice

Eight pumice fragments in the aggregate weigh 124.4 g. Although likely brought by aboriginal inhabitants to the site to be used in abrading tasks, none of the stones exhibit use-wear.

'Clinkers'

There are two bags labelled 'clinkers'. The many fragments appear to be nothing more than concretions and conglomerates, formed by geochemical action, possibly associated with the seasonal inundation.

3. BONE

Analysts sorted the faunal collection by evidence of modification and use. Butchered and unmodified bones represented the most numerous class of data in the collection, reflecting the subsistence patterns of the village inhabitants. Due to the fragmentary nature of most bones - a condition aggravated by their exposure to seasonal flooding, causing splitting, exfoliation and mineralization - only a very general categorization was possible in most instances. The faunal evidence does, however, reveal a diverse diet, focused primarily on mammals.

Mammals - 14,054
Birds - 29
Fish - 16

Rodent - 2
Wolf - 5
Coyote - 5
Bison - 9
Gray Fox - 1
Mountain Sheep - 1
Deer - 1
Red Fox - 2
Owl - 1
Golden Eagle - 1
Turkey - 1

In addition, analysts found human remains (13 bones) mixed in with the faunal material.

Human Remains

Faunal analysts found thirteen human bones in the collection. When these small specimens, mostly small hand and foot bones, were identified as human, they were handled with care and respect and left unstudied, except for the recording of their type. There are five 1st phalanxes, three 2nd phalanxes, and four 3rd phalanxes, one of which is charred. There is also an atlas, complete except for a missing transverse process.

Although seasonal flooding could account for deposition on the site of human bones, eroded, perhaps, from the Larson ossuary or upstream sites, the specimens reported here are most likely from victims of warfare at the Larson site.

Bowers' early 1960s investigations found human skeletons "strewn on the lodge floors", these in contrast with the formal interments at the nearby ossuary. Corpses found in the village had not been intentionally buried; rather lodges had collapsed, covering the bodies, which numbered at least 71 (Owsley, Berryman & Bass 1977:120). In addition, skeletal remains from a number of the individuals exhibited osteological, artifactual (e.g., embedded projectile points) and demographic evidence for warfare (Deitrik 1980; Owsley, Berryman & Bass 1977:119-128). Most relevant is the evidence that the limbs of a number of individuals were removed - possibly for religious reasons (cf. Owsley, Berryman & Bass 1977:125).

Bone Tools

a) Bone Awls

Of the five bone awls, three are from ribs (Plate 52). The pointed tips are missing from two (99.59 and 116.19 mm long). (These specimens could possibly be sled runners from children's toys - a common artifact among northern Plains tribes (Lehmer 1971: 157) - but they seem much too small and thin for that purpose.) The third is complete, measuring 217.99 mm in length. Weathering has exposed the cancellous bone on all three specimens.

The two remaining awls are from metapodials. One is split lengthwise from the condyle (distal end of the element), tapering from there to the point (Plate 51). The condyle functioned as the head of the awl. The awl blade is highly polished. The fifth awl is split lengthwise from the proximal end of the element. The awl head retains an articular facet. The specimen tapers from there to the point. This awl was once polished, but weathering has caused it to deteriorate slightly. Both awls are nearly the same length (76.87 mm and 85.38 cm).

b) Polished Bone Fragments

Faunal analysts identified eleven bone fragments exhibiting intentional polish. These fragments do not retain landmarks which might allow determination of element or taxon, nor does enough remain to ascertain tool type(s). On the basis of polishing, however, they clearly came from a bone tool or bone tools of some kind.

c) Shaft Wrench

The two specimens are from flat cancellous bone, probably ribs (Plate 53). When complete, the specimens exhibited holes drilled through the bone. They are now split longitudinally, leaving only a portion of the holes. One specimen originally had at least two holes. On the other, only one abrading hole is evident. The ends of both are also missing. In their current condition, one specimen is 78.87 mm long; the other is 110.10 mm long. Weathering has affected both artifacts, making it difficult to discern use-wear, if any.

d) Squash Knife

The specimen exhibits cancellous bone where a process was removed, probably a spine. If this is correct, the knife was likely from a scapula. The knife blade opposite the missing process exhibits some evidence that it was originally highly polished. As well, beveling along the blade edge indicates it was sharpened. The tip is broken, and it appears that a portion of the handle area is also missing. The specimen is 119.95 mm long.

e) Scapula Hoes

The 43 hoe specimens were likely from bovid and cervid scapulae (Plate 54). Nine specimens retain all or portions of the glenoid cavity. The glenoid cavity is absent on three other specimens; it was likely removed during manufacture, a common practice among inhabitants of late Middle Missouri sites (Lehmer 1971:152). These 11 specimens are in various states of preservation, some with anterior and posterior edges and blade portions remaining. Others exhibit portions of the blade, while either anterior or posterior edges are missing. Typically, the maker has removed the spine regardless of glenoid cavity presence or absence.

Most commonly, the specimen fragments are from the blade, either with portions of 1) both anterior and posterior edges, 2) or one or the other edge, 3) or with both edges missing. These were identified as hoes by means of one or more of criteria: the element (scapula), intentional modification and use-wear indications. Modifications are evident in the removal of the spine, and in some specimens, intentional sharpening or notching of the hoe blade. Sharpening ranges from steep to shallow bevels. Use-wear is exhibited in edge polishing (anterior, posterior, and hoe blade) and battering. Some blade fragments exhibit unpatterned striations running across the upper face of the blade. These presumably resulted from use.

Analysts conducted length, width and thickness measurements on 12 specimens. Results are summarized below. Standard deviations reflect the considerable size variation in the collection.

	L	T	W
MEAN	229.81	41.27	85.81
MAX	307.44	58.21	125.05
MIN	139.56	22.21	47.16
STD	49.95	12.62	19.93

f) Bone Pestle

This specimen (cataloged in 1991 as a "bone grinder") is the head of bovid humerus (adult) which has been cut from the element. The cut face is slightly wavy and somewhat rough, suggesting it was not sawn from the humerus, but chopped or sliced in a single motion. Cancellous tissue is exposed on the cut face. A red stain clings to portions of the cancellous tissue, and some tiny red granules are embedded in the bone structure. The substance may be ochre, indicating the specimen might have been used as a pestle to grind the substance and/or prepare the pigment. If so, it was an expedient use, probably a single episode, because there is little evidence for wear on the cancellous (cut) surface. The specimen weighs 166.0 g.

g) Bone Tube/Pendant

Made from a mammalian long bone, this specimen was once cylindrical, but is now fractured along its entire length, leaving half the original tube. The ends have been smoothed by grinding. It appears the surface was once polished, but weathering has contributed to its deterioration. Its length is 82.29 mm; the original diameter was about 15.20 mm. The specimen is similar to bone tubes and bone pendants illustrated in Lehmer (1971:93, 160), thought to have been used principally as beads or pendants.

h) Decorated Bone/Tooth Fragment

This specimen appears to be a fragment of a disc-shaped object, made of highly polished bone (or tooth enamel), weighing .9g. It has two finely incised linear decorations on one face (Figure 8) and some very fine striations. If bone, the decorations and striations could indicate a gaming piece such as a bone slider (cf., Lehmer 1971:156), a common artifact in village sites through time.

4. TRADE GOODS

Copper Tinkler

The tinkler is a piece of sheet copper formed in a slightly conical tube, one edge folded over the other; the striker is missing (Plate 55). Its length is 31.04 mm; maximum diameter is 8.04 mm; minimum diameter is 7.10 mm; and the gauge of the metal is .87 mm. Tinklers were attached to the fringe on various garments, and are quite common in Post-Contact Coalescent sites. Those of brass or copper are found at earlier post-Contact Coalescent sites; tinklers of iron are more common in the latter part of the period (Lehmer 1971:161).

Brass Tinkler or Bead

This object is sheet brass formed in the same way as the tinkler above. Its length is 22.48 mm; maximum diameter is 5.93 mm; minimum diameter is 5.63 mm; and the gauge of the metal is .35 mm.

Copper Fragment

This object is a badly oxidized copper fragment (weighing 1.1g) formed from sheet copper. It was probably once tubular, and about the length of a cuprous bead or tinkler. It cannot be identified further.

Copper Sheet Fragments

Three sheet copper fragments (total weight of 2.0 g) are of flat stock, with an average gauge of .90 mm. This probably represents material kept on hand for the manufacture of beads, tinklers, and so on.

Iron Projectile Point

This triangular, stemmed projectile point is made of iron (Plate 56). It is badly oxidized, with portions exfoliated. It has a total length of 27.85 mm; a stem length of 8.02 mm; a body length of 19.83 mm; a maximum body width of 15.16 mm; and a weight of .90 g. This specimen is not a trade point; rather it was manufactured locally from flat stock (the gauge is approximately 1.5 mm; rust inhibits accuracy) which was possibly obtained through trade.

Glass Beads

There are two opaque turquoise specimens in the collection. One is complete, the other is a split bead. Both are circular in shape (similar in shape to type IVa18 defined in Hayes 1983:230) and were produced by the tubular bead manufacture method. The complete specimen is 7.0 mm in diameter with a bead hole of 1.25 mm in diameter. It weighs .4 g.

Tubular Glass Bead

This tubular glass bead is very dark blue with two red twists running longitudinally. It is mostly complete, but fractured near one end. It is similar in shape and design to type Ib'3 in Hayes (1983:227). Its original length was 15.57 mm; its diameter, 6.88 mm; the bead hole diameter, 2.18 mm; and the weight, .8 g.

Wire-wound Glass Bead Fragments

These specimens, three glass bead fragments, were recorded in 1991 as bone beads. They are opaque, off-white, oval-shaped beads of the same type, and similar to type W1c3 (see above) in shape. Two of the fragments are split longitudinally; one is split hemispherically and longitudinally. One specimen allowed measurement. It has a maximum diameter of 7.61 mm; a length of 10.78 mm; a bead hole diameter of 1.03 mm; and a total weight of 1.1 g.

Wire-wound Glass Bead

This doughnut-shaped specimen, recorded in 1991 as bone, is a complete glass bead. It is off-white and opaque and similar in shape to type WId4 in Hayes (1983:232). Its diameter is 4.22mm; it is 2.05 mm thick; its bead hole diameter is 1.65 mm; and its weight is .1 g.

Clay Pipe Fragment(?)

This specimen is possibly a fragment from a clay pipe bowl. It is not, as originally cataloged, miscellaneous stone. It weighs 4.0 g; has a maximum length of 28.66 mm; a maximum outside diameter of 16.17 mm; a minimum outside diameter of 14.27 mm; a maximum cavity diameter of 9.07 mm; and a minimum cavity diameter of 8.13 mm.

5. LATER EUROAMERICAN ARTIFACTS

Cartridge Cases

The five necked, brass cartridge cases are centerfire. One is a caliber .270 specimen; the remaining are caliber .257. These calibers and cartridge types are in use today. Three are headstamped "REM-UMC 257 ROBT". "ROBT" indicates a cartridge designed by N. H. Roberts. The commercial Roberts cartridge was licensed to Remington/Union Metallic Cartridge Company in 1934 (Barnes 1995:35). The three specimens post-date 1934.

The remaining caliber .257 specimen is headstamped "SUPER-X 257 ROBERTS", this referring to Roberts, who designed cartridges in the 1920s and 1930s. The caliber .270 case is headstamped "PETERS 270 WIN", marking the Peters' version of the 270 Winchester cartridge. The earliest caliber .270 Winchester dates to 1925, the year in which it was designed (Barnes 1995:35, 40). This cartridge case can be no older than 70 years.

Lead Ball

Lead balls were used in muzzle-loading muskets and rifles. This specimen weighs 15.2 g (234.5 grains). Badly flattened in discharge, its original caliber cannot be accurately determined, but, based on grain weight, it was probably larger than .45 caliber. Projectiles of this type are used today by black-powder enthusiasts. The most reasonable date for the introduction of lead balls into this area is the late 17th/early 18th century. There is no way of establishing the time at which this specimen was introduced into the Larson site setting.

Nails

The 11 wire nails (steel) or fragments (19.3 g) (range in size from 4 to 8 D (pennyweight)) are mostly badly oxidized; some are exfoliated. Though introduced in the United States during the latter half of the 19th century, wire nails did not exceed 90% of the U. S. production until 1920 (Edwards and Wells 1993:18). Most likely these specimens date to the 20th century.

Amorphous Ferrous Items

Mostly small sheet metal fragments, the specimens are highly oxidized. In the aggregate they weigh 16.4 g.

Glass

Glass sherds derive from windows (flat sherds) and containers (curved sherds) such as bottles. In total, the 28 specimens weigh 32.6 g. No sherd is much larger than a postage stamp. None exhibit decoration. All but two are clear. One is cobalt blue, and translucent. The other exception is an off-white opaque sherd embossed "CAP" along a molded, curved rim. No other letters or portions thereof are present. Color, opaqueness, "CAP" and the curved rim suggest a canning jar lid liner.

Ceramics

Tableware, a decorative item, an electrical insulator, and crockery are represented in the 11 ceramic sherds (wt=55.0 g). Two off-white, glazed earthenware rimsherds derive from plates or saucers, as does a base sherd. Two body sherds of the same type may be from either plates/saucers or cups. A third rim sherd (off-white, glazed) exhibits remnants of a handle or lug. A painted brown line was part of a now unintelligible design. The handle/lug remnant curves toward the rim, indicating that the container from which it derives was not utilitarian tableware.

The insulator fragment, which is quite small (2.4 g), is tentatively identified. It is off-white, opaque, and it exhibits the rough paste of an industrial item such as an insulator. Three of the four crockery specimens (wt=35.8 g) are split body sherds. The other is a basal sherd. All are dark-brown glazed, indicating they derive from single or multi-gallon storage crocks.

Footwear

The remnants of a shoe or boot heel do not provide a firm basis for determining footwear type or style. Morphology, however, suggests a cowboy boot or 19th/early 20th century ladies dress boot heel. The heel is constructed from alternating leather layers fastened together and to the sole by shoe nails, some of which remain. The specimen weighs 46.7 g.

Discussion

With the exception of the cartridge cases, the time frame for specimens discussed here cannot be tightly estimated. In general, the artifacts represent EuroAmerican leisure firearm use, domestic activities, and construction. Firearm use may be related to transient hunting episodes. The other activities are - and this can be expected - likely related to Lewis Larson's occupation of the landscape shared by the Larson village site. The lead ball seems the only artifact which could be tied to the aboriginal occupation, but the contextual situation at the Larson site prohibits any meaningful statement of that nature.

IV. SUMMARY AND CONCLUSIONS

The surface collection from the 1991 data recovery program at the Larson site yielded a large inventory of artifacts - substantially more than the official inventory as received (18,689 additional items) - but the scope of analysis was limited by several environmental and archaeological factors: a lack of spatial integrity, because the artifacts came from a seasonally flooded ground surface, the coarse-grained nature of the collection strategy (30 meter grids, no piece-plotting), and the absence of maps and other information about the location of previously excavated features (which would have allowed some study of the relation between surface and subsurface material). Still, we have attempted to convey a sense of the physical and spatial character of the site by analyzing the distribution of cultural materials by grid unit.

Although the collection units were too large to be used for the production of cluster maps, it is clear from the unit-by-unit distribution that the material is concentrated within 12 adjacent squares. It is reasonable to conclude that this was the core of the village, perhaps the location of unexcavated house structures. Without additional information, however, such speculation can go no further. Consequently, the analysis has concentrated on general features of the artifact inventory to achieve the required goals of age and cultural affiliation determination.

When considered in isolation from the previous findings at the Larson site, the range of material recovered in 1991 fits into the profile of a Plains Village site, with abundant lithics, ceramics, and range of faunal material that indicates a diverse diet and long-term habitation. The presence of a scatter of Euroamerican materials (sheet copper, brass, iron) and trade goods (e.g. glass beads) place the site (presuming that this is not later contamination) within the historic period.

Detailed analysis has shown that the artifact range and frequency generally confirm the results of earlier studies. Lehmer (1971) assigns this site to the Le Beau phase of the Post-Contact Coalescent Variant. The relatively large percentage of European trade goods recovered from the Larson cemetery indicates an occupation around 1750-1785, while the crainometric and archaeological data suggest tribal affiliation with the Arikara (Deitrick 1980:3). The fact that few trade goods were found in 1991, conflicting with the earlier results, is not regarded as significant here. This could be an effect of the recovery strategy (a pedestrian survey on a sandy, flood-level terrain), but the main reason is likely that the previous data came largely from the cemetery and, therefore, consisted of grave goods.

The ceramics data from the 1991 surface collection are consistent with studies of temporal and cultural affiliation carried out at comparable Middle Missouri sites. Out of a total rim sherd count of 1293, 904 (70.04%) rim sherds were identified as Talking Crow Ware; 191 rim sherds (14.9%) as Stanley Braced Rim Ware; and 185 rims (14.3%) as Le Beau Ware.

There is, therefore, a preponderance of Talking Crow Ware, followed by Stanley Braced Ware and Le Beau Ware. This range and distribution of wares is characteristic of other Post Contact Coalescent Variant sites in the region.

The attributes of all the notched projectile points fall within the range of variability of Plains Village points (Brown, Brown and Hanenberger 1982), dating to the Late Prehistoric period. The characteristics of the unnotched points are consistent with small points dating to the Late Woodland and Plains Village periods in Iowa and the Dakotas (A.D. 500 to 1700) (Morrow 1984, Brown, Brown and Hanenberger 1982). Although the side-notched points are clearly consistent with Late Plains Village cultures, the presence of a Woodland component at the site (Bowers 1967) creates the possibility that some of the unnotched triangular points may relate to this earlier occupation.

Although the ceramic ware types and projectile points data confirm the previous cultural attribution and age of the site, an analysis of ceramic variability provides some deeper insight into the social dynamics of this village. Between the three major wares outlined above, there is substantial typological variation - a phenomenon found at other sites with similar ceramic inventories. At the Swan Creek site (39WW7), for example, Hurt (1957: 40) suggests that the types classified as Talking Crow Brushed and Stanley Plain form two ends of a series with Le Beau Plain as the intermediate type. The sequence is based on the changes in the strength of the lips - from Talking Crow Brushed with thin lips, to Le Beau Plain with thickened lips, to Stanley Plain with braced lips. This sequence of types has been noted in other sites in South Dakota. In a comparison of pottery from the Stanley Focus of the Dodd site and the Snake Butte Focus of the Phillip Ranch site, Lehmer (1954) notes a marked increase of Stanley Plain and corresponding decrease of Talking Crow Brushed (Lehmer 1954: 101). The Larson site may fit into the later part of the period - i.e. post 1750 - corresponding to the results of previous work: the surface survey yielded 373 sherds of the Talking Crow Brushed type, 60 sherds of the Le Beau Plain type, and none of the Stanley Plain type.

Such variation, marked by changes in technology and decoration, may simply reflect the work habits of different potters or the same potter over time - in recognition of the human capacity for innovation. Stylistic change can also reflect changes in other aspects of society. Among a host of hypotheses offered by various scholars (Lehmer 1954; Smith 1977; Hurt 1957; Zimmerman and Bradley 1993; Owsley and Jantz 1994) to explain the variations within a ware, Zimmerman and Bradley (1993) suggest that changes in pottery styles from Initial to Extended Coalescent times can be explained by a dispersal of large village groups to larger geographical areas capable of supporting smaller groups for short periods of time. The authors, using a computer simulation model, explain this 'dispersal' phenomenon as a direct result of intra-tribal warfare which, in turn, was the result of growing populations, diminishing land resources, and malnutrition and disease.

The Larson site, it can be speculated, may fit this model even though it belongs to the Post Contact Coalescent period. The village site seems to have been occupied for a short period of 35 years, from 1750 to 1785 (Jantz, 1970; Lyon, 1970; Deitrick, 1980).

Skeletal evidence from the Larson cemetery - and, significantly, the presence of scattered human remains in the 1991 surface collection analyzed here - suggests that the inhabitants, probably Arikara, were participants in the intermittent warfare reported for the late 18th century (Owsley and Bass, 1979, Owsley and Jantz, 1994, Owsley, Berryman, and Bass, 1977; Deitrick, 1980). The Larson site may therefore have been a casualty in that warfare, destroyed by another group competing for land and food resources.

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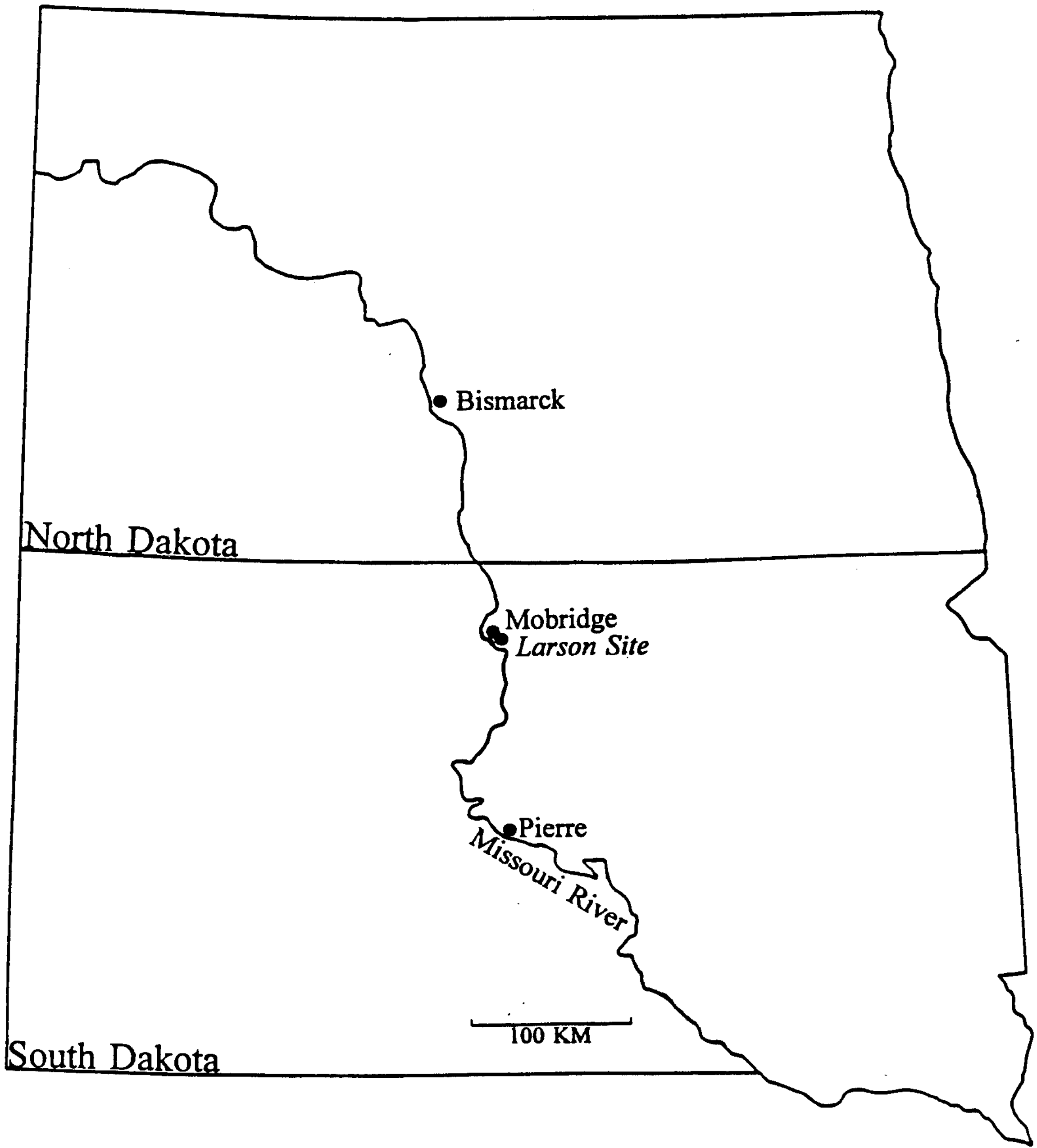

Figure 1. Larson site location within the Middle Missouri Sub-area.

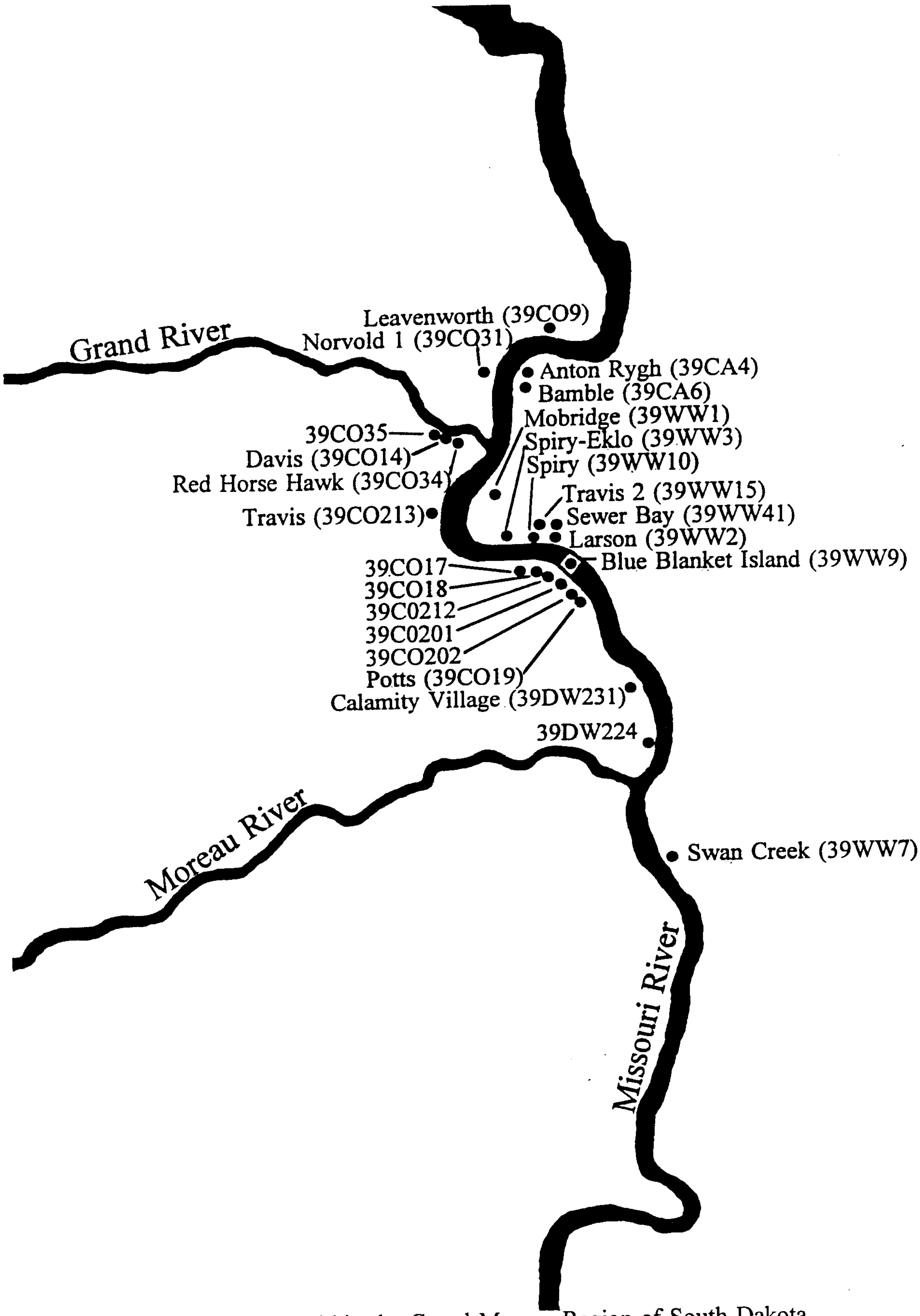

Figure 2. Location of sites within the Grand-Moreau Region of South Dakota.

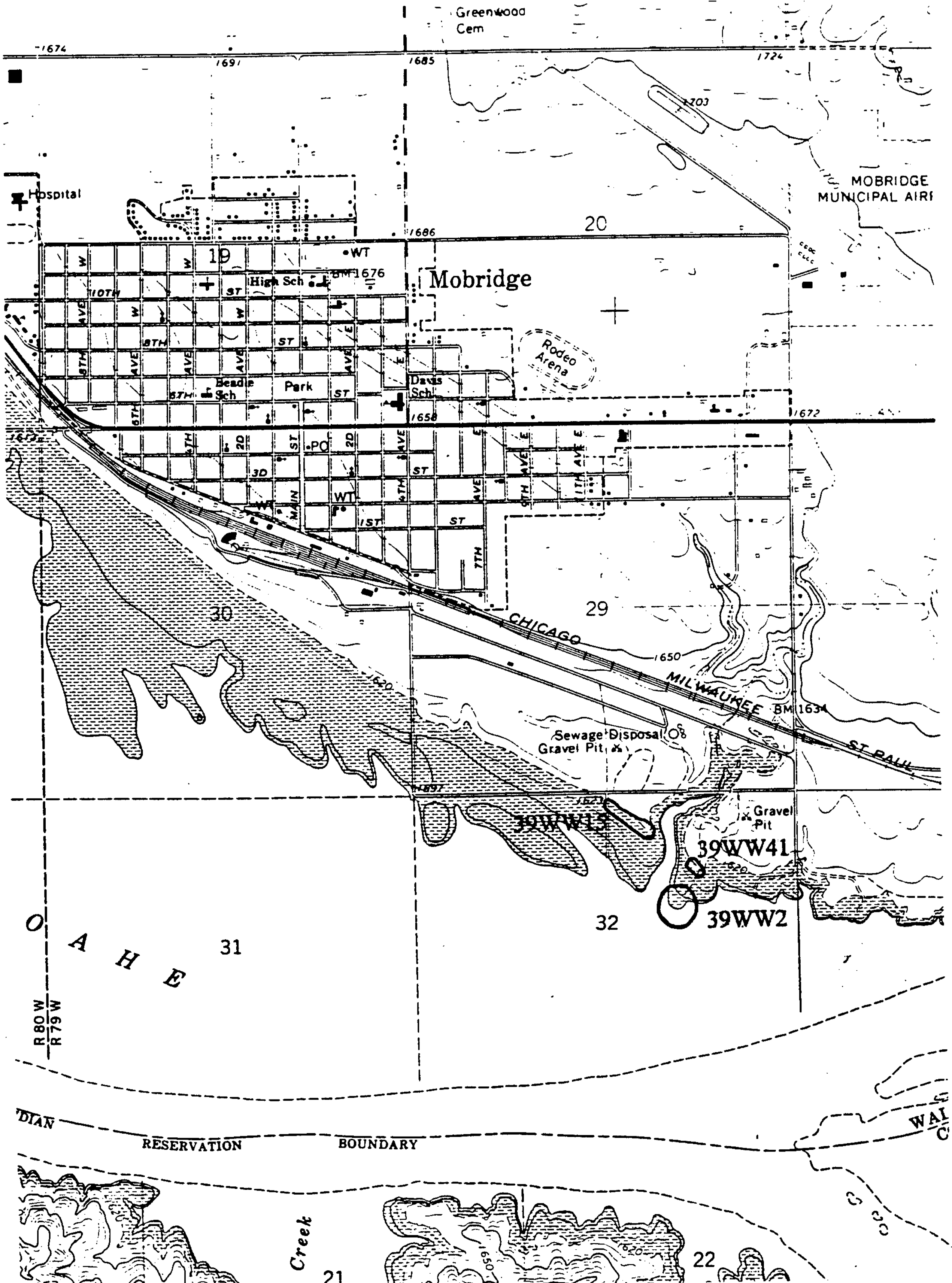

Figure 3. Map from USGS 7.5 min Quadrangle for Mobridge, S.D., 1967.

THE PREHISTORIC FORTIFICATION.

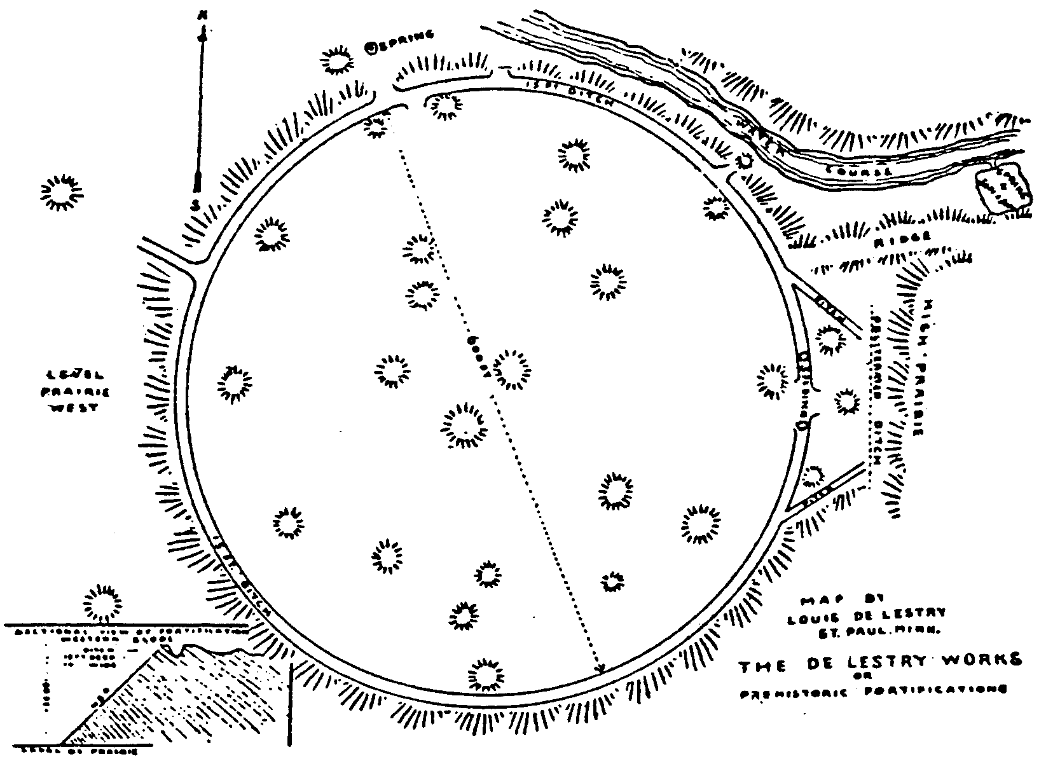

Figure 4. De Lestry Map of the Larson fortified village.

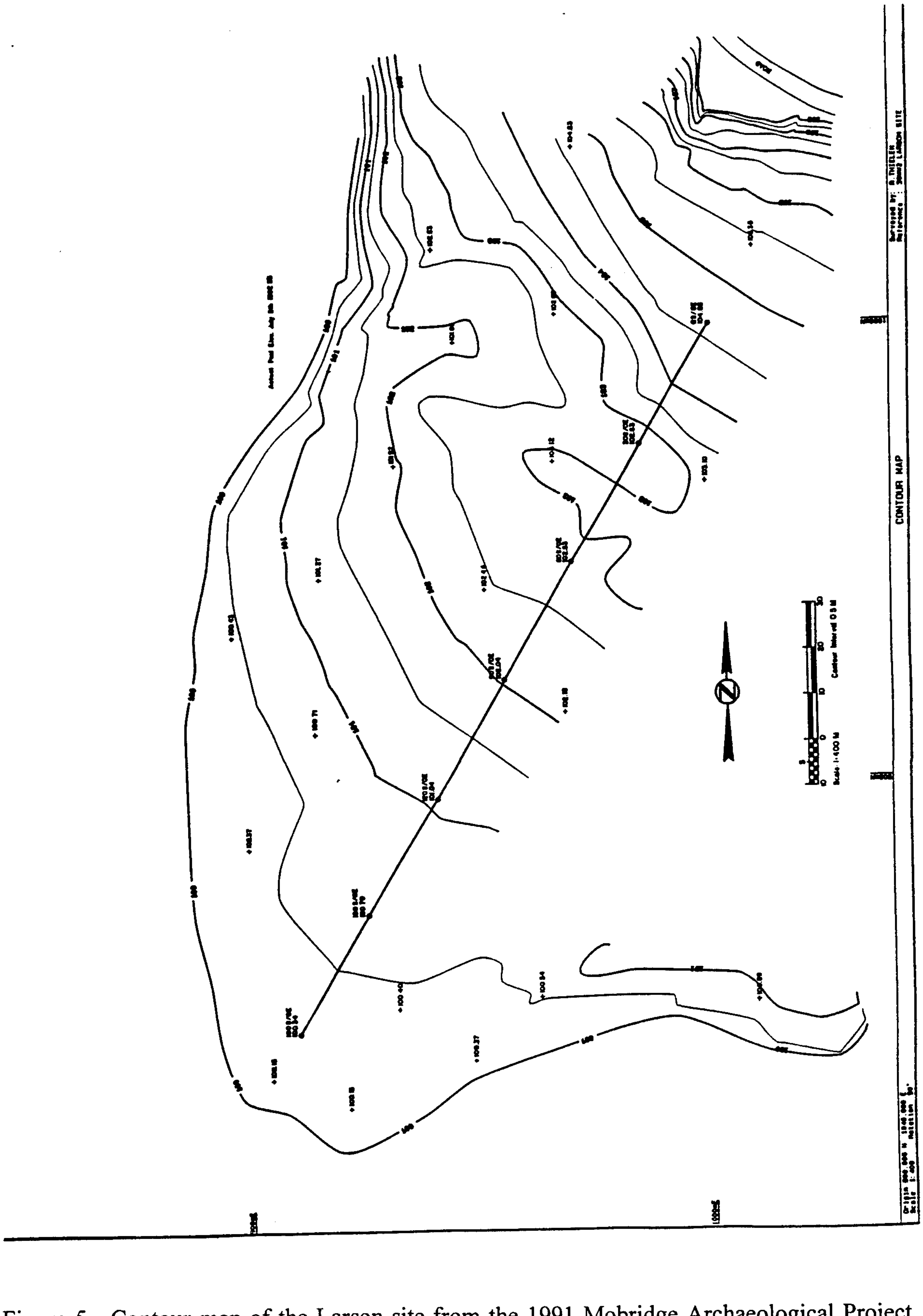

Figure 5. Contour map of the Larson site from the 1991 Mobridge Archaeological Project.

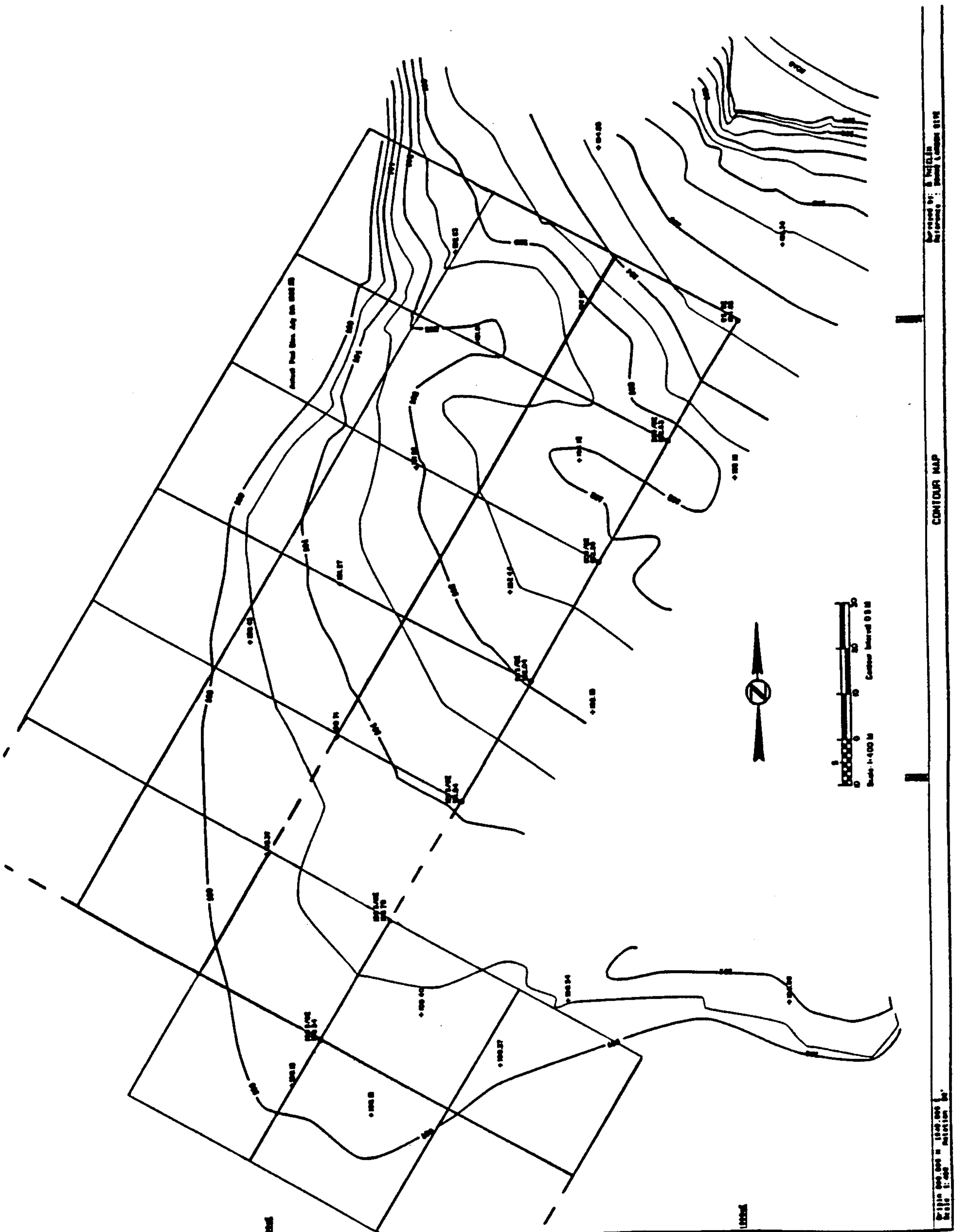

Figure 6. Contour map of the Larson site from the 1991 Mobridge Archaeological Project, with the surface collection grids.

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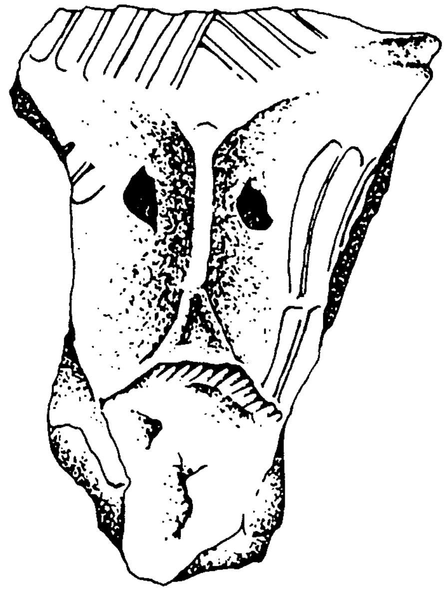

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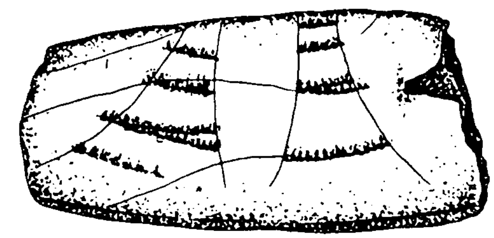

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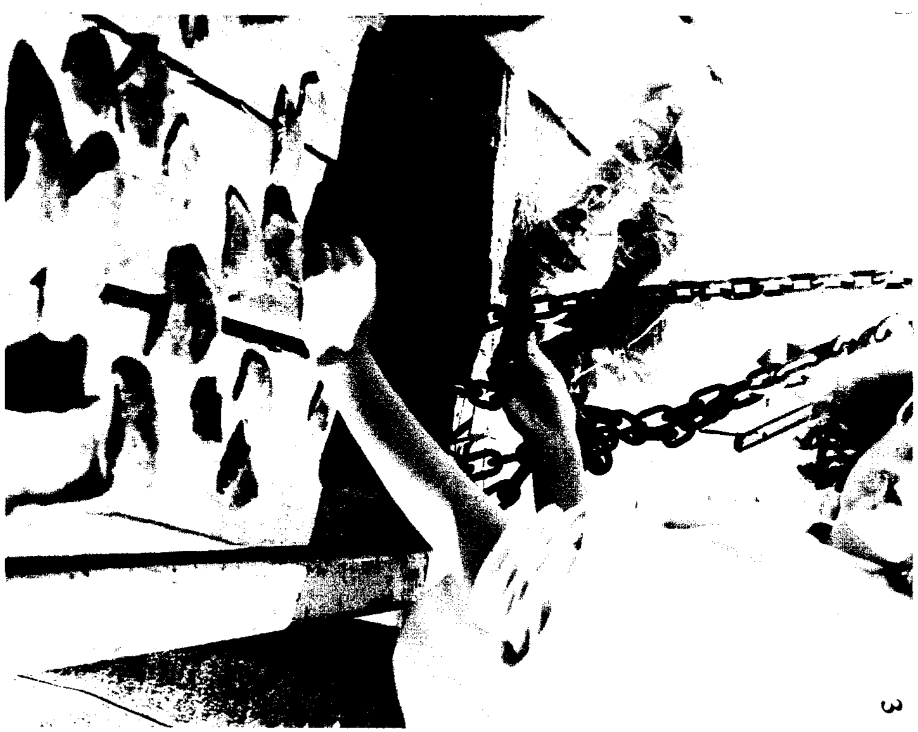

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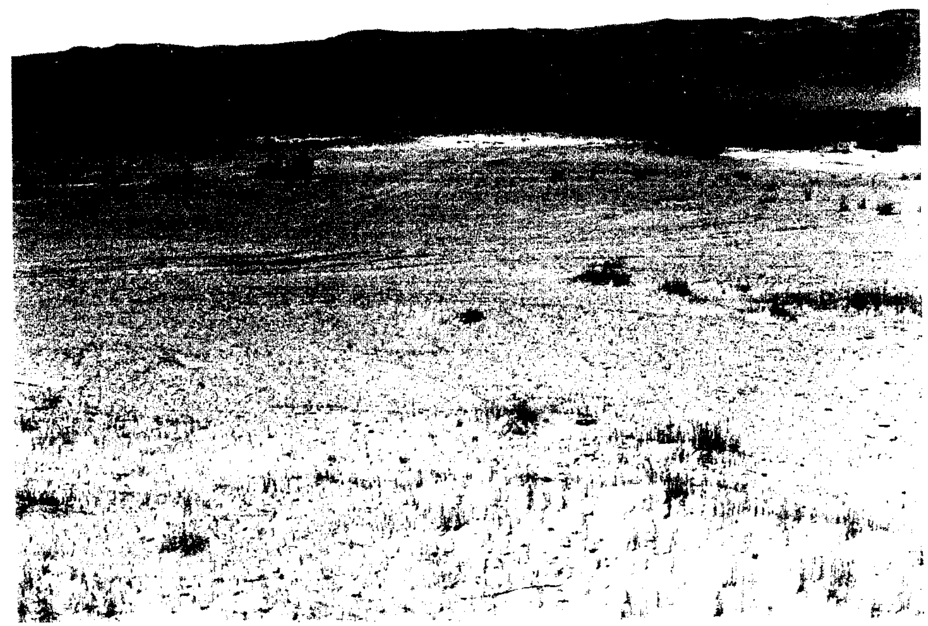

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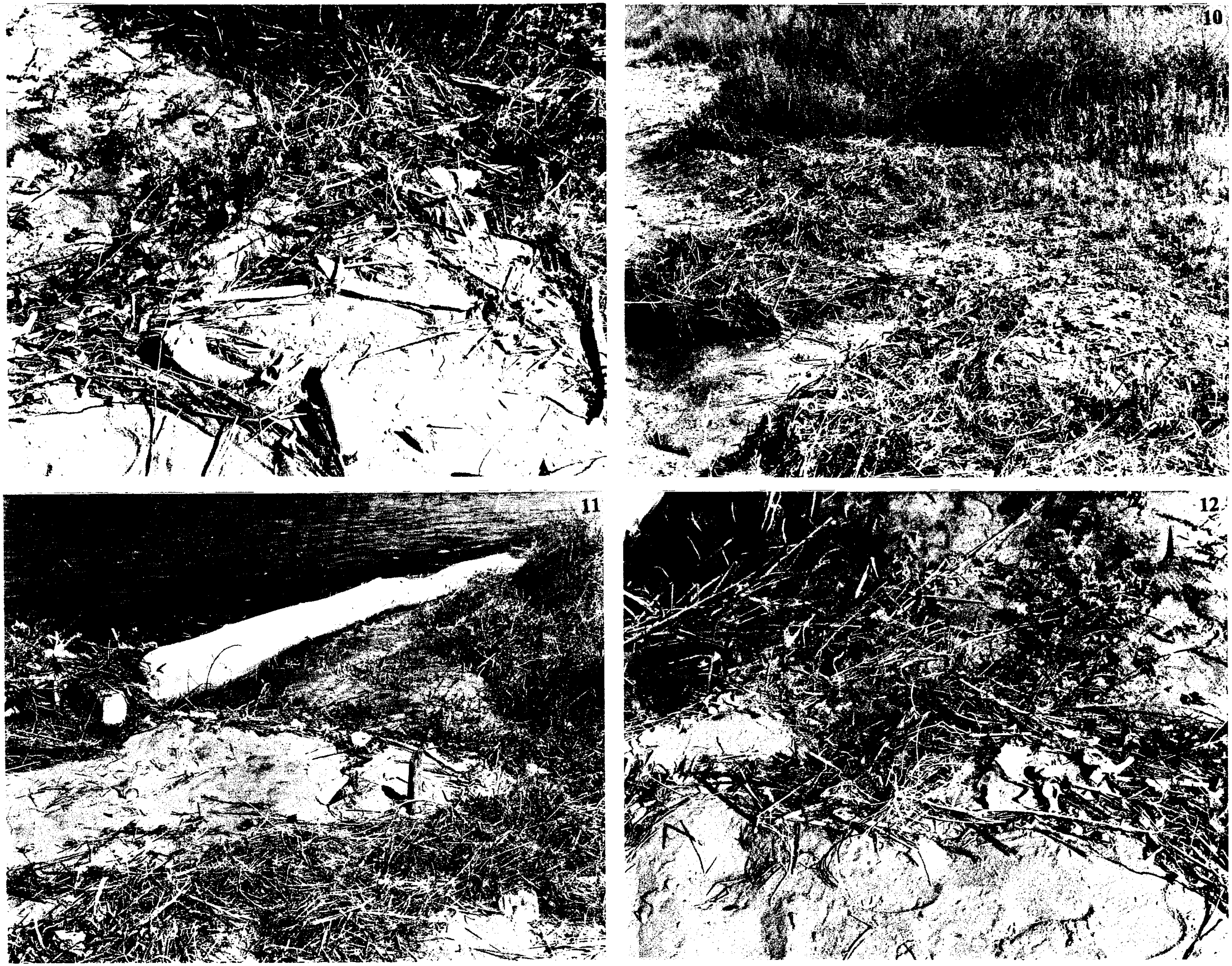

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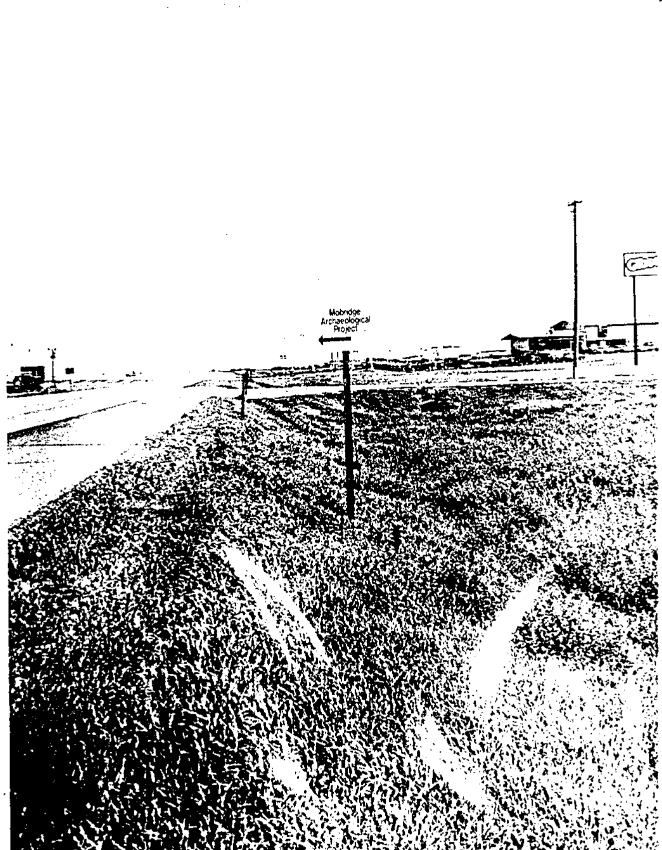

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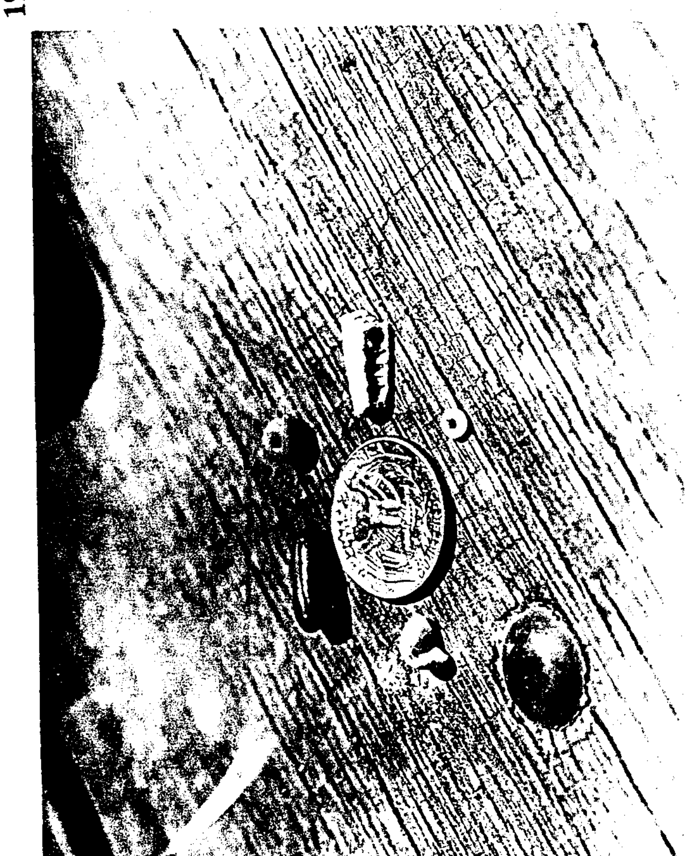

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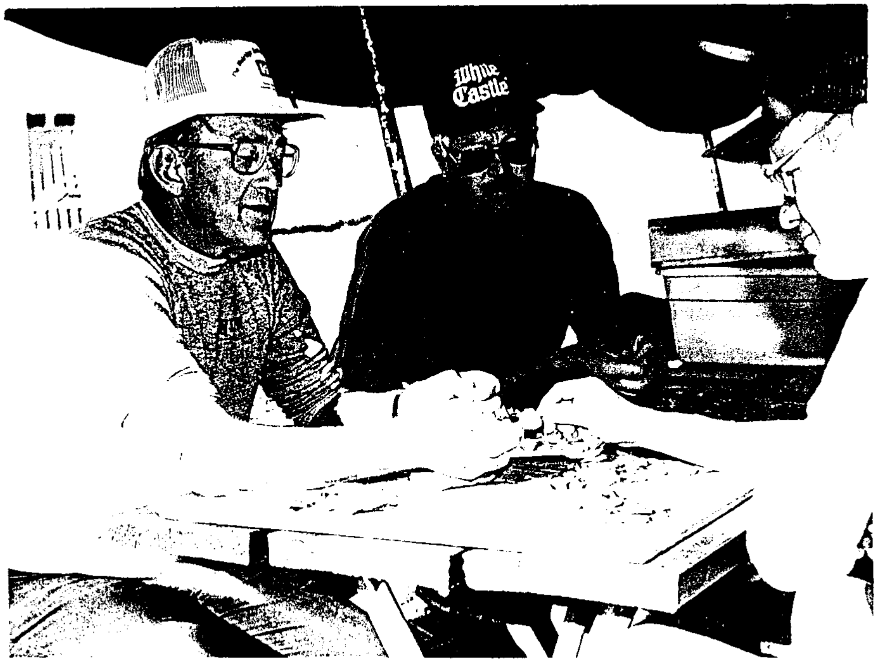

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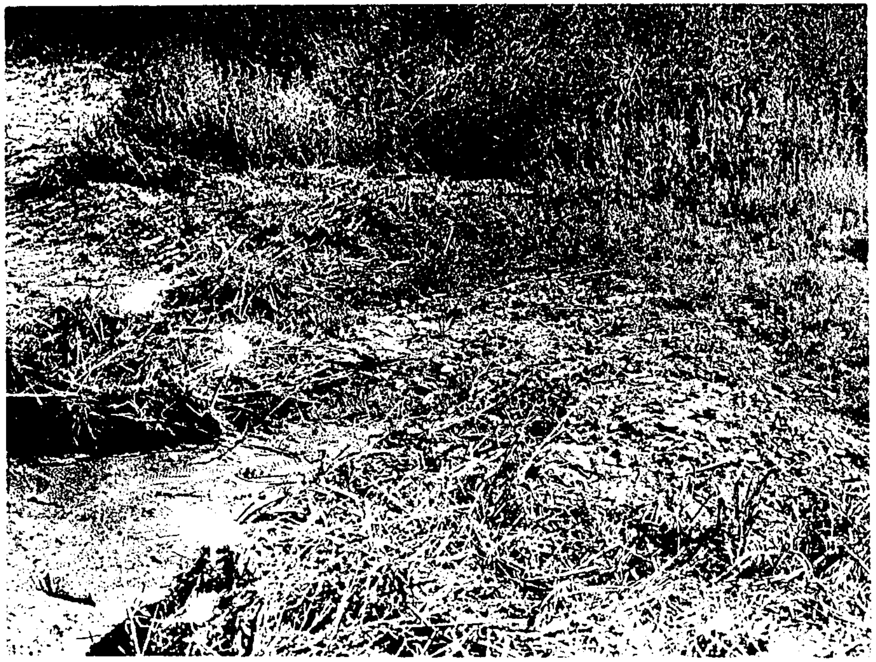

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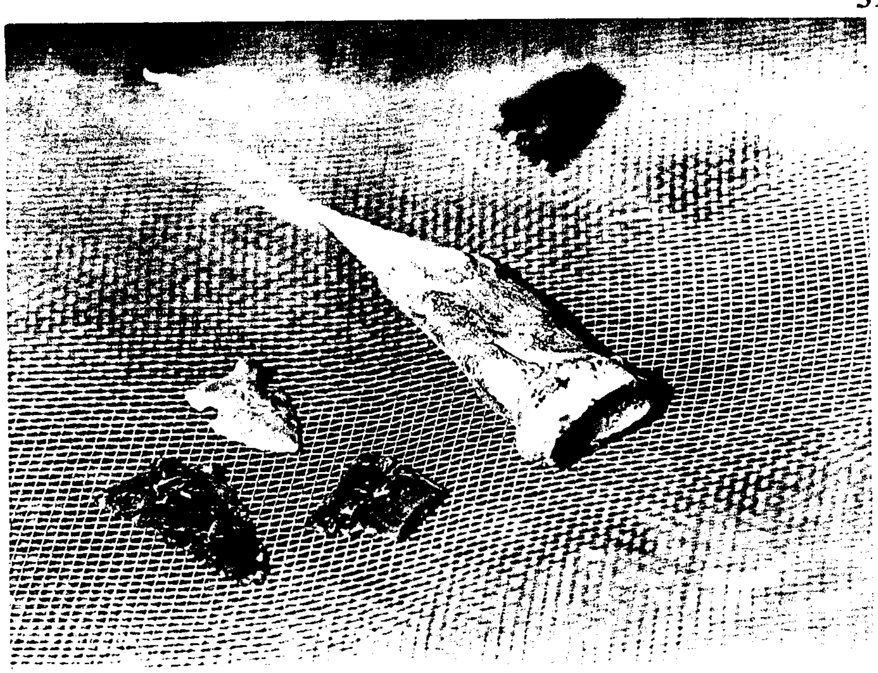

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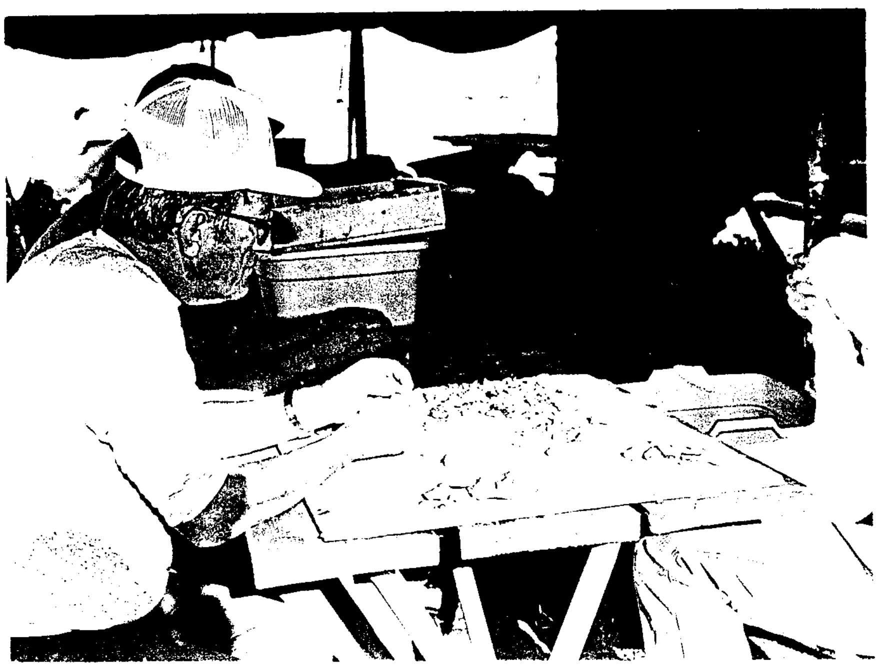

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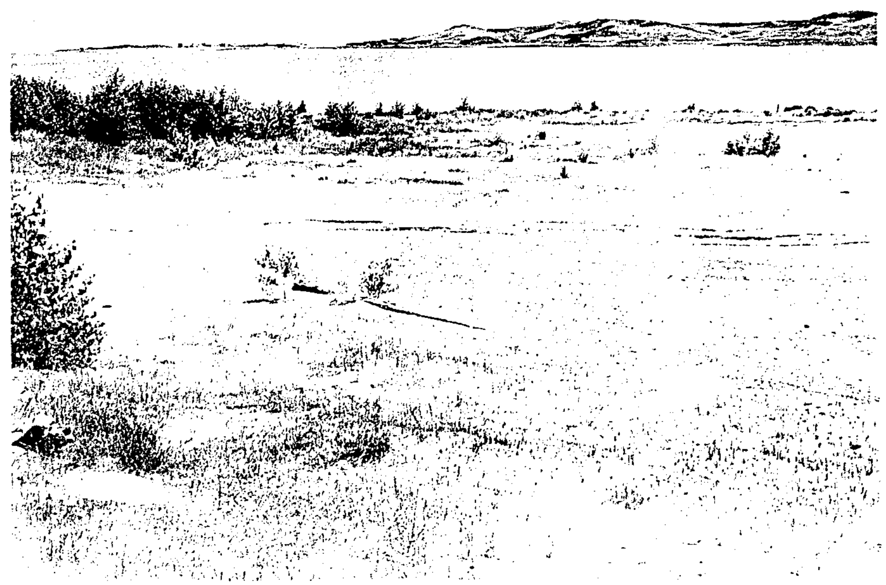

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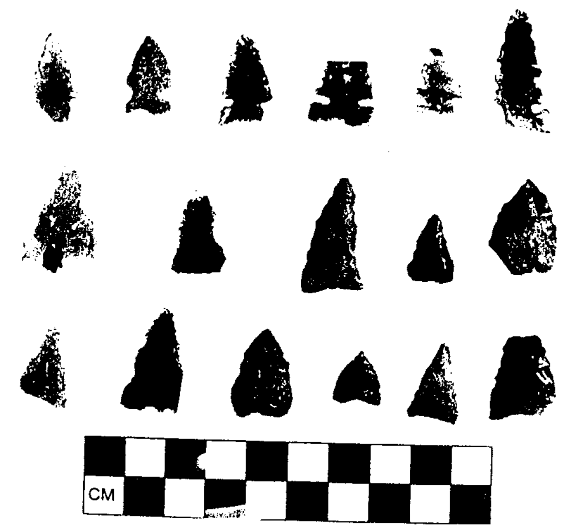

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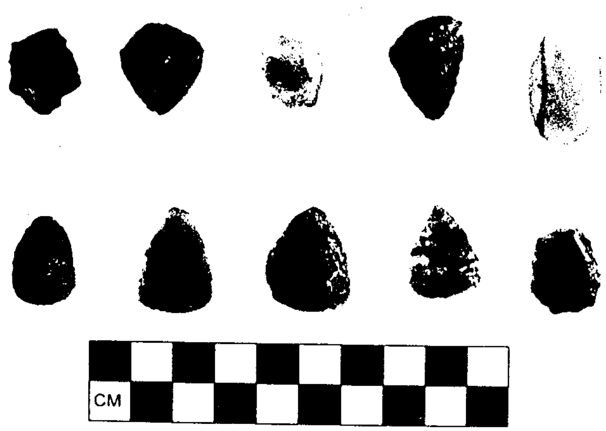

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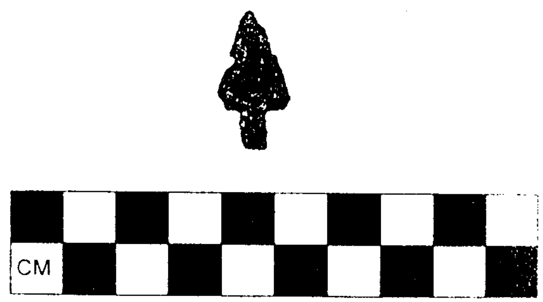
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Appendix 2: Distribution of Cultural Material by Grid Unit

Distribution of cultural material by grid unit, ordered from northwest (top) to southeast (bottom).

Grid Units	Lithic Tools	Core/ Debitage	Rim Sherds	Body Sherds	Bone Tool	Other Bone	Trade Goods	Euro-American Goods	Misc.	**Total by Unit**
0s/60w	0	1	1	0	0	2	0	1	0	5
0s/30w	0	2	0	1	0	31	0	1	0	35
0s/0w	0	6	0	1	0	23	0	0	1	31
30s/60w	6	1	1	2	3	80	0	0	0	93
30s/30w	0	1	0	0	0	4	0	0	0	5
30s/0w	0	5	0	2	0	5	0	0	1	13
60s/60w	0	2	7	118	0	32	0	0	1	160
60s/30w	0	3	1	27	0	10	0	0	2	43
60s/0w	0	2	0	0	0	1	0	1	0	4
90s/60w	0	1	0	27	0	268	0	0	0	296
90s/30w	1	17	13	43	0	12	1	0	0	87
90s/0w	0	0	0	13	0	114	0	0	0	127
120s/60w	7	84	111	798	2	1059	0	69	2	2132
120s/30w	2	20	17	192	0	19	0	0	0	250
150s/60w	4	59	16	149	1	296	0	0	0	525
150s/30w	261	1426	487	6380	11	4022	9	6	10	12612
150s/0w	53	433	161	1933	0	1340	3	0	3	3926
150s/30e	6	68	48	471	0	434	0	0	0	1027
150s/60e	4	18	8	106	0	194	0	1	1	332
180s/0w	80	717	251	3020	42	2617	5	3	4	6739
180s/30e	30	293	138	1728	7	2633	2	2	3	4836
180s/60e	5	36	33	648	0	202	0	0	1	925
Total by Type	459	3195	1293	15659	66	13398	20	84	29	**34203**